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TABLE OF CONTENTS ON LAST PAGE OF READING.**THE RUBBER SYMPOSIUM POSTPONED.**

THE Rubber Symposium which was planned for the afternoon of January 8, Rubber Club Day, has been postponed. It was found that the day would be so full of business meetings, election of officers and features connected directly with the work of the Club, that little time would be left for the symposium. The plan has not been given up, however, and in connection with some later Club function it will undoubtedly be carried into effect.

ELECTRIC POWER IN THE RUBBER INDUSTRY.

ELECTRIC power has become a tremendous factor in American manufacturing. The individual motor has eliminated the great first cost, darkening and dirt-gathering propensities of overhead shafting, pulleys and belting, which consume considerable power and must be kept turning even though only a few machines are

being used. The electric motor entails no power drain except when the particular machine attached to it is in operation. That rubber manufacturers have been quick to avail themselves of these advantages is shown by the Census of Manufactures for 1914, the latest available figures of the Department of Commerce. It appears that of the 199,543 total primary horse-power employed in the manufacture of rubber goods in the United States, 114,803, or 57.5 per cent, is electric. The further fact that of this 114,803 horse-power 33,983, or 42 per cent, is rented, instead of being generated in each establishment, clearly indicates the importance of an article entitled "Late Developments of the Electric Drive in Rubber Mills," on another page of this issue.

THE AMERICAN RUBBER INDUSTRY AFTER THE WAR.

A PARAGRAPH in the economic convention between the Allied Nations, drawn up in Paris last summer, is becoming a source of increasing concern to the American rubber trade. It reads as follows:

The Allies declare themselves agreed to conserve for the allied countries, before all others, their natural resources during the whole period of commercial, industrial, agricultural and maritime reconstruction, and for this purpose they undertake to establish special arrangements to facilitate the interchange of these resources.

It is an indisputable fact that the future of the great American rubber industry, which uses two-thirds of the world's production of crude rubber, rests with the British Government. There is not enough Para rubber to supply the wants of this country, even if every pound of it came here, and all the rubber grown in the Malay States, Sumatra and Java is completely in the hands of England and Holland. The British Consul General in New York is able to satisfy present requirements, and while it is unlikely that England or Holland would deny such an important customer as the United States, there is always that possibility. Opinion differs among American business men as to the probable outcome. Some are doubtful if the Allies will be able to carry out their program of preferential trading, whereas others express the growing fear that the restrictions imposed upon American importers on the plea of maritime necessity will be continued after the war, when England, Germany and the United States will all be keen competitors for world trade. In this race for business it is realized that England will have a big advantage, for through her present control of the imports of raw materials she has ascertained by whom sold, the prices paid and ultimate destination of all goods manufactured with raw materials coming from British possessions. She has built up in this country a strong machine for the control of our war trade, which might be

used to regulate our imports to the requirements of the Allies after the war and thus see to it that their needs and interests have priority over all others.

Consul General Clive Bayley, however, is discreetly silent regarding the future policy of the Allies with respect to crude rubber imports as affected by the Paris Convention, although the Foreign Trade Council, the Merchants' Association of New York and the American Manufacturers' Export Association are all making inquiries and have lodged pertinent questions with the administration at Washington. Certainly this irksome situation, together with England's contemplated protective tariff, holds possibilities that may prove detrimental to American interests. Viewed in this light the imperative need of an adequate supply of rubber grown within our own borders as soon as possible becomes more than ever apparent. Meanwhile the fourth convention of the National Foreign Trade Council, to be held at Pittsburgh, Pennsylvania, January 25, 26 and 27, has for its purpose the earnest consideration of the many serious problems besetting our foreign commerce, and it is to be hoped that a scheme for a more satisfactory working arrangement may be evolved.

RUBBER AND AN AMERICAN MERCHANT MARINE.

THE rubber industry, dependent as it is upon merchant ships to maintain the supply of crude rubber, looks with approval upon the tendency toward control of American shipbuilding manifested by the purchase of the American Shipbuilding Co. by the American International Corporation. Imports from the Far East have already been greatly delayed by the shortage of ships, and it is hoped that this new and broader policy of our greatest American shipbuilding company may relieve the situation.

The need of such a course is seen in the fact that almost every great nation except the United States has followed the example of the British admiralty in forbidding the transfer of ships to another flag for a period of three years after the close of the war. American owners and shipbuilders, on the contrary, may sell where they please until the new shipping act goes into effect, and afterwards as soon as the Shipping Board's appropriation for the purchase of ships has been exhausted. Thus the whole world is free to buy ships of us, while we can have only those we build ourselves, and our growing foreign trade is to a degree in danger for want of bottoms in which to transport it. Of the 1,300,000 tons of merchant ships under contract in American yards over 300,000 tons are being built on foreign account, and it is certain that wider control of the shipyards by American shipping interests will tend to build up an American merchant marine and supply one of our greatest needs.

At the outbreak of the war the world's merchant shipping amounted to about 49,000,000 tons, and at the normal rate of increase should now be 53,000,000 tons. As a result of losses by submarine destruction, the

unusual amount of repair work and greatly increased naval construction, it is estimated that the supply of ships cannot be restored to normal before 1922. Meanwhile war conditions in England have raised the cost of ship construction to equal that in the United States, and American shipping interests now see their opportunity to enter this field on equal terms. In the past our shipbuilders have never had under construction enough ships of one type to permit the introduction of methods and economies ordinarily practiced in bulk production. Systematized process manufacturing has enabled America to turn out reapers, automobiles, tractors, etc., more cheaply than any other nation, and shipbuilders feel that the opportunity at last presents itself to apply similar methods to their line as well.

COTTON AND THE 1917 TIRE FABRIC DEMAND.

RUBBER and cotton are the two staple raw materials of primary importance for the manufacture of automobile tires. In 1916 the American tire industry alone consumed practically half the world's 1915 production of crude rubber, and 85 per cent of the United States Sea Island cotton crop. It is estimated that 25,000,000 tires will be made in 1917. But the yield of plantation rubber has advanced to meet it, and while the supply of Sea Island and Egyptian cotton will probably be adequate, there are shipping difficulties and questions of loom capacity that must be considered.

Sea Island cotton has the preference for tire fabrics because of its great strength. Although it is now grown on the mainland of South Carolina, Georgia and Florida near the sea, the entire American crop for the season of 1915-16 ending July 31 was only 91,920 bales, of which 2,727 bales were exported to England and the Continent. About 85 per cent of the American consumption was used to meet the 1916 demand of about 150,000 bales, and Egyptian cotton supplied the rest. The British West Indies, during the past decade, have been highly successful in growing a long-fiber cotton with seed obtained from the famous Colonel Rivers plantation off the South Carolina coast.

In view of the inadequate supply of Sea Island cotton it is not surprising that those forehanded American manufacturers who have gone into plantation rubber in the Far East should turn their attention to the other principal raw material for tire building. Already one large firm has purchased a tract of 10,000 acres in the South on which to grow Egyptian cotton, and the indications are that others will probably enter this field.

Much study has been devoted of late to the idea of providing an adequate rubber supply within our own borders. Long-fiber cotton is equally important; and as the culture of high-grade Sea Island and Egyptian cotton has proved a success along the southern seaboard and in the South, is not its extension to meet our requirements an equally important piece of industrial preparedness?

The Year 1916 in Review.

A RETROSPECT of the twelvemonth just brought to a close leaves no doubt that it has been the greatest year of the rubber industry. Production has increased tremendously in most lines; factory enlargements have become the commonplace news of the day, but the great outstanding feature of the year has been the phenomenal growth of American tire manufacture, which alone consumed practically half the world's 1915 production of crude rubber. While shipments of wild rubber decrease, the production of plantation rubber has increased, and thanks to the British Government, has been obtainable at virtually normal prices despite the extraordinary demands and impediments of the war.

The growth of tire manufacture is graphically reflected in the patents issued. Fully half of the 1916 American patents relating to rubber apply to tires and treads, tire building and repair machines, looms for tire fabrics of special weave, vehicle wheel rims and rim fastenings for the application of pneumatic, cushion and solid tires. There were nearly a hundred patents issued relating to machines used in tire construction. Its growth is also evidenced by record breaking exports, which, for the eight months ending August, 1916, were valued at double those for the corresponding period of 1915, including \$11,722,908 worth of automobile tires, which went chiefly to England, Australia, Russia, New Zealand and Canada. Stock value is always a certain index of the condition of a business, and shares in several leading tire companies that formerly sold below their \$100 par value have recently been quoted at \$257, \$292.50, \$328 and one even as high as \$1,650. During this period of expansion the non-skid tread has triumphed, and there is a marked tendency on the part of motor-car manufacturers to adopt the S. A. E. standardized schedule of tire sizes and oversizes.

Meanwhile, the achievements of rubber chemists have been no less notable. They are rapidly making rubber manufacture an exact science. This is true of improved methods of analysis and aging tests, and particularly so of accelerators. Beginning with the use of aniline oil they have added to the list until 30 or 40 accelerators are now known with which to cut the previous period of vulcanization in half, or better, and thus double production. The advent of pressure cure as a substitute for the orthodox dry heater has notably modified footwear manufacture and may influence the time-honored methods of making clothing, mackintoshes and carriage cloth. Another advance in footwear is the development of combination rubber and fiber or leather soles on a commercial scale, to offset the ever increasing shortage

of sole leather. Improvements have been made in methods of cold vulcanization, and important investigations in Russia indicate the possibility of hot vulcanization without sulphur. American chemists have been struggling with the problem of a new motor-car fuel and believe that by utilization of various by-products and waste, enough industrial alcohol can be provided, which will greatly reduce the cost of solvent naphtha for rubber use. The marked tendency of American chemists toward greater frankness in discussing improved methods for the common good augurs well for the future. In Germany synthetic rubber has been improved but little and apparently no way has been found to reduce its cost, while the attitude of American chemists is largely one of scientific interest.

The war has proved that rubber is not a luxury but a necessity. Its principal uses in warfare are too well known to require enumeration here, but the chief developments of the present conflict are the enormous demand for tires and for rubberized fabric used in the manufacture of army equipment and in the construction of aeroplanes and balloons. There are myriad ingenious uses of rubber, too, but none compares with the marvels of surgery in mending broken soldiers with it—replacing broken noses, jaws and teeth, and grafting skin and flesh to cover them. Its increased applications in the building of artificial limbs are also notable.

The prosperous condition of rubber manufacture in America has rendered possible much highly commendable welfare and educational work, which makes for far greater health and contentment of employes as well as maximum output in the factories. This spirit of improvement has also affected mill conditions from the standpoint of health and safety. The industry has grown so rapidly that for the most part it is conducted in buildings of modern fireproof construction, light, well-ventilated, and equipped with excellent sanitary and safety devices. It is not surprising, therefore, that although minor strikes have been of frequent occurrence, most of them have been settled without difficulty.

The past year has proved a revelation even to the most optimistic and far-sighted rubber men, but with our well-equipped factories, the supply of rubber tolerably assured, the automobile industry still growing, and the nations beyond the seas depending upon us more and more to supply their needs, there is every indication that the coming year will outstrip it. In this connection it is confidently believed that The Rubber Club of America, Inc., will continue to grow in prestige and membership, as it has in the past, and to exert a steady influence of distinct benefit to the whole industry.

A Brief Review of the Organic Accelerators.

The following summary represents an effort to classify the principal nitrogen-bearing accelerators in a logical manner, and to record concisely their characteristics and efficacy as described by R. Ditmar and translated into French for "Le Caoutchouc & la Gutté-Percha" by Georges Noyer; Andrew H. King in "Metallurgical and Chemical Engineering"; S. J. Peachey in "The India Rubber Journal"; and others.

WHATEVER may be the future of synthetic rubber, the investigations in connection with it led to the discovery of organic accelerators, which have revolutionized several lines of rubber manufacture. It was found that synthetic rubber could not be vulcanized without the presence of certain organic catalyzers to facilitate the union of rubber and rubber-like substances with sulphur, and when all natural rubber was substituted the increased rapidity of vulcanization was truly remarkable. The difficulty, as for a time with plantation rubbers, appears to have been the absence of certain so-called impurities found evenly distributed throughout Para rubber coagulated by the Amazon method. These natural catalyzers of rubber latex are believed to be decomposition products and related to the proteins. It is certain that all organic accelerators yet known are nitrogen-bearing and many have amino groups, so that the function of nitrogen appears to be important.

Manufacturers who had been using the old, well-known mineral accelerators began to experiment with these new organic catalyzers and found that they could double their output without expensive increase of steam pressure or danger of impairing the product by high temperature. Those engaged in the production of cheap molded goods discovered that by employing both high temperatures and catalyzers their increased output would take care of overhead as never before.

While this most important recent development in rubber chemistry is still in its infancy, there is already considerable generalization and a goodly amount of definite facts on which to build. It is thought that, unlike the mineral accelerators which undergo no chemical change during vulcanization, an organic catalyzer unites with one of the reacting substances and forms an unstable compound which then reacts with the other substance. Meanwhile the catalyzer is set free and the entire process is repeated. From a mechanical standpoint a catalyzer is most conveniently mixed when a solid capable of being very finely pulverized. A high boiling point is essential to prevent vaporizing during vulcanization and consequent spongy appearance, known as "blowing."

The following list includes the most important organic accelerators now in use:

Carbon bisulphide addition products with

Aniline
Diphenylthiourea or thiocarbonylurea
Dimethylaniline
Tetrahydropyrrrole
Dimethylamine
 $\beta\beta$ Dimethyl α methyl trimethylene amine

Ammonium compounds

Ammonium borate
Aldehyde ammonia
Quaternary ammonium bases

Amino compounds

Accelerene or paranitroso dimethylaniline
Para-phenylenediamine
Tetramethylenediamine
Hexamethylene-tetramine or hexamethylenamine or formalin
Sodium amide
Naphthylenediamine
 $\beta\beta$ Dimethyl Δ trimethyleneimine
Trimethyleneamine
Benzylamine
Nitrosodimethylaniline

Piperidine and derivatives

Piperidine or aminopentane
Methyl piperidine

Quinoline and derivatives

Quinoline
Quinoline sulphate or quinoline sulphonie acid
Hydroxy quinoline
Quinosol
Oxiquinoline
Oxiquinoline sulphonic acid
Oxiquinoline sulphide

Miscellaneous

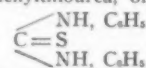
Anthraquinone
Antipyrine
Naphthylamine
Urea derivatives
Anilides

Formanilide
Thioformanilide

Several of these accelerators are covered by patents and cannot be bought of the concerns manufacturing them until a license for their use has been obtained from the patent owners. Applications for such licenses should be addressed to Dr. Hugo Schweitzer, of the Synthetic Patents Co., 115 Hudson street, New York City. Prices will be quoted to license holders. The catalyzers in question are piperidine and methyl piperidine, tetramethylenediamine, hexamethyl-tetramine, thiocarbonylurea, and aniline hydrochloride. The first three of these are not made in the United States at present.

CARBON BISULPHIDE ADDITION PRODUCTS.

With Aniline: Diphenylthiourea, or thiocarbonylurea,

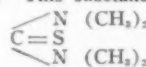


is one of the earliest known organic accelerators. It takes the form of large colorless tablets melting at 154 degrees C., and is a very efficient catalyzer, particularly for quick-curing stocks because it does its work at the very beginning of vulcanization. The proportions used vary from $\frac{1}{2}$ to 3 per cent.

With Dimethylaniline: Cited by Ditmar and King.

With Tetrahydropyrrrole: $(\text{CH}_2)_4\text{NH}$. Known as pyrrolidin in Germany. Cited by Ditmar and King.

With Dimethylamine: This substance,



gives an active addition product. With Para, 100 per cent sulphur and the addition of 1 per cent of the compound of carbon bisulphide and dimethylamine vulcanization takes place completely with 15 minutes' cure at 135 degrees C. (German patent 269,512.)

With $\beta\beta$ Dimethyl α methyl trimethylene amine: Cited by Ditmar.

AMMONIUM COMPOUNDS.

Ammonium borate: This has a noticeable effect on the cure, but the fact is only of scientific interest, according to Ditmar.

Aldehyde ammonia: $\text{CH}_2\text{CH(OH)NH}_2$. This very satisfactory catalyzer is readily soluble in water, sparingly soluble in alcohol and almost insoluble in ether. It melts between 70 and 80 degrees C. and sublimes without decomposition at 100 degrees C. Its efficacy as an accelerator, according to King, may be seen in the fact that 100 parts Para, 10 parts sulphur, and 1 part aldehyde ammonia will cure in 30 minutes at 45 pounds steam pressure, 140 degrees C. (Ditmar says 1 hour at 3 atmos-


pheres—42 pounds—while without the accelerator 2 hours would be required), whereas 90 parts Para, 9 parts sulphur, and 1 part lime require 85 minutes at the same pressure for a cure.

Quaternary ammonium bases: These are covered by Bayer & Co., patents of 1914 together with aldehyde ammonia, paraphenylenediamine, sodium amide, benzylamine, and naphthylendiamine, all rapid accelerators.

AMINO COMPOUNDS.

Accelerene: This widely used English catalyzer is among the most powerful known accelerators. When used in the proportion of $\frac{1}{4}$ to $\frac{1}{2}$ of 1 per cent it reduces the required period of vulcanization to one-third normal with highly satisfactory results; and in conjunction with certain other familiar substances in quick repair compounds reduces the period of cure to one-eighth normal. Cheap mixings containing considerable reclaim or waste, particularly if golden antimony sulphide be present but no free sulphur, do not respond so readily as medium and high-class mixings. In such cases sufficient free sulphur must be added and the proportion of antimony sulphide may be reduced to that needed to give the desired color, after which the usual acceleration will be attained. In the manufacture of vulcanite the addition of $\frac{1}{4}$ of 1 per cent of accelerene to a mixture consisting of 100 parts rubber and 40 parts sulphur reduced the period of vulcanization from 6 to 2 hours, yielding a hard and very durable product.

Essentially paranitroso dimethylaniline, and wholly different from the German type of accelerators, accelerene owes its activity to the presence of the nitroso group, and not to feeble basic properties. Aside from its high acceleration it possesses several characteristics in use that are of great value. Goods vulcanized in its presence show somewhat greater tensile strength, probably due to the diminished degree of depolymerization possible in so short a period of heating. Vulcanization stops when the goods are taken from the pan or press, so they suffer little deterioration in storage, tests of this now covering a period of two years. Sulphuring-up may also be entirely prevented by its use, though at the sacrifice of acceleration. The quantity of sulphur may be reduced to 3 or $3\frac{1}{2}$ per cent, $\frac{1}{2}$ per cent of accelerene is then added and the mixing cured in the ordinary manner. As employed for this purpose the catalyzer facilitates a complete combination of rubber and sulphur, with the result that little or none of the latter remains in the rubber.

Para-phenylenediamine: $C_6H_4(NH_2)_2$  This very

poisonous catalyzer melts at 140 degrees C., sublimes without decomposition at 267 degrees C., is readily soluble in alcohol and ether, and moderately so in water. In Bayer & Co.'s German patent No. 280,198, January 1, 1914, it is stated that this accelerator gives good satisfaction with synthetic rubber, 100 parts isoprene rubber having been cured completely upon being mixed with 10 parts sulphur, 2 parts paraphenylenediamine and being heated in a press for 15 minutes at 45 pounds steam pressure.

Tetramethylenediamine: $NH_2(CH_2)_4NH_2$ Known also as putrescine, this is a natural product of protein decomposition formed during the putrefaction of animal matter such as fish. It is produced chemically by Bayer & Co.

Hexamethylene-tetramine: Known also as Hexamethylenamine and *Formin*.

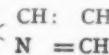
Miscellaneous Amines: Other amino compounds cited by King as of lesser importance yet having some accelerating power include: sodium amide, $Na NH_2$ (rapid acceleration according to Ditmar); naphthylenediamine, $C_{10}H_8(NH_2)_2$ (rapid acceleration according to Ditmar); trimethylenamine $(CH_2)_3N$; benzylamine, $C_6H_5CH_2NH_2$ (rapid acceleration according to Ditmar); $\beta\beta$ dimethyl Δ trimethylenimine; and nitrosodimethylaniline.

PIPERIDINE AND DERIVATIVES.

Piperidine or Aminopentane: $C_5H_{10}NH$. A liquid miscible in water in all proportions, having a specific gravity of .881 at 0 degrees C., boiling at 105.7 degrees C., and smelling like pepper and ammonia. This, the prototype of the more recently discovered organic catalyzers, was brought out and patented by Bayer & Co. in 1912 for use in the manufacture of synthetic rubber, but its extraordinary value as an accelerator in connection with natural rubber for both hard and soft rubber articles soon overshadowed its original purpose. A mixture of 100 parts Para and 10 parts sulphur that requires an hour to cure at 53 pounds, steam pressure may be cured perfectly with only 15 minutes' heating by the addition of $\frac{1}{2}$ part piperidine. The product obtained from this compound contains about 3.5 per cent of combined sulphur. Piperidine may also be used for producing hard rubber by adding 25 per cent sulphur. (German patent 266,618.)

Methyl piperidine: $C_6H_{10}(CH_3)$. This active catalyzer boils at 107 degrees C.

QUINOLINE AND DERIVATIVES.

Quinoline: C_8H_7N  While this is a good acceler-

ator, its derivatives, the sulphate and quinosol, are more frequently used because of the ease of mixing. Quinoline has a specific gravity of 1.0947 at 20 degrees C.; it boils at 240 degrees C.; and is soluble in alcohol and ether, but only sparingly so in water. Its odor is disagreeable and penetrating; its taste, bitter and acid; and on exposure to moist air is converted to the hydrate. As an accelerator the amount used is 2 or 3 per cent. Quinoline does not appear to enjoy accelerating power, according to Ditmar.

Quinoline sulphate: Also known as quinoline sulphonic acid. An excellent accelerator yielding good-looking, well-vulcanized rubber. King suggests that the potassium salt of this acid might give better results.

Hydroxy quinoline: This derivative, which ought to prove a valuable accelerator, takes the form of prismatic needles melting at 76 degrees C. and boiling at 266.6 degrees C. under 752 mm. pressure. Although readily soluble in alcohol and volatile with steam it is only sparingly soluble in cold water.

Quinosol: This accelerator takes the form of sulphur yellow needles soluble in both alcohol and water. It is manufactured by Frisch, of Hamburg, Germany, and mixes easily with rubber compounds before vulcanization. In a mixture of Peruvian rubber, 12 kilograms; white substitute, 19 kilograms; Kaolin (China clay), 2 kilograms; chalk, 5 kilograms; and sulphur, 4.5 kilograms, the accelerating effect, according to Ditmar, is not great, but quinosol acts quite differently when mixed with litharge and crude rubber free of substitute, the combined effect being greater than the sum of the effects of each employed alone. This fact is of great importance to rubber footwear manufacturers who use mixtures containing litharge exclusively, as they can cut the period of vulcanization in half by using 2 to 3 per cent of quinosol.

Oxiquinoline: Cited by Ditmar.

Oxiquinoline Sulphonic Acid: Gives good acceleration but very porous rubber, according to Ditmar.

Oxiquinoline sulphide: This is a satisfactory but too active accelerator. It can be used with all sorts of compounds because it answers all the needs of the industry. In tests conducted by Ditmar in collaboration with the Japanese chemist Nawa-Naami, a mixture containing Peruvian rubber, 40 kilograms; brown rubber substitute, 10 kilograms; paraffin, 5 kilograms; chalk, 41 kilograms; and sulphur, 4 kilograms, required 2 hours' heating at a pressure of 4 atmospheres (56 pounds). With oxiquinoline sulphide the mixture was vulcanized in 50 minutes. With quinosol sulphate 75 minutes was required. Tests of accelerated and

Probably the advancing cost of gasoline and other products derived from petroleum will one day render profitable the distillation of the vast deposits of so-called hydrocarbon shales of the Green river formation of northwestern Colorado and northeastern Utah. The United States Geological Survey has been investigating these deposits for three years past, and the director in his report states that very rough but cautious calcu-

The following items are of particular interest to the rubber trade:

| Articles. | Ten Months Ending, | | Increase. |
|--|--------------------|--------------|--------------|
| | Oct., 1914. | Oct., 1915. | |
| India rubber, including automobile tires | \$9,587,180 | \$28,685,814 | \$19,098,634 |
| Chemicals, including sulphuric and other acids | 23,992,032 | 134,370,958 | 111,478,926 |
| Lead from domestic ores | 3,645,233 | 9,951,901 | 6,306,668 |
| Zinc and manufactures | 7,713,944 | 48,481,130 | 40,767,186 |
| Mineral oils | 120,638,004 | 171,653,832 | 51,015,828 |

[illegible]

COAL-TAR PRODUCTS OCCUPY AN IMPORTANT PLACE IN RUBBER MANUFACTURE. IN ORDER TO GRAPHICALLY SHOW THESE DERIVATIVES AND THEIR SOURCES, THE ABOVE DIAGRAM HAS BEEN CONSTRUCTED FROM DATA COURTEOUSLY FURNISHED BY THE BARRITT CO., NEW YORK CITY.

Late Developments of Electrical Drives in Rubber Mills.

By William H. Easton, Westinghouse Electric & Manufacturing Co.

AS in most other lines of manufacturing, electric power is coming to be widely used in rubber factories, for the individual electric motor to drive each machine has much to recommend it. As a rule, rubber manufacturers prefer to generate their own electric power, believing it more economical,

of the engine room force; the assurance of more reliable power, and lower operating costs.

It would seem, therefore, that many rubber mills might adopt such a system with benefit, and as the installation mentioned presents some interesting departures from ordinary usage, a description of its salient features may prove interesting.

Alternating current at 2,200 volts is received from the central station lines. Part of this current passes through transformers and is reduced to a low voltage for lighting and operating some small motors, but most of it is used at full voltage. Both high and low voltage lines lead to the main switchboard from which the power is distributed throughout the plant.

The motors used in the first three steps of the process are all applied in the same way and are similar in type. Each is a Westinghouse 2,200-volt, alternating current, slip-ring motor, the details being as follows:

| Fig. | H.P. | R.P.M. | Machines Driven. |
|--|------|--------|--|
| 1 | 100 | 525 | Two 16 x 24-inch Birmingham washers. |
| Not shown | 200 | 500 | Three 20 x 50-inch Birmingham mills. |
| 2 | 200 | 500 | Two 20 x 50-inch Birmingham warming mills. |
| A 75-kilowatt Westinghouse direct-current generator for supplying current to the calender motor. | | | |

It will be noticed that these motors are of the same voltage as the Central Station lines. If motors of lower voltage had been selected it would have been necessary to install transformers, but under the circumstances this expense is avoided. As can be seen from the illustrations, these motors are all enclosed by wire netting so that there is no danger of unauthorized persons coming near them.

Slip-ring motors are used instead of squirrel-cage motors, because a squirrel-cage motor in starting ponderous machinery of this kind draws a very heavy current from the line; but with a slip-ring motor the starting current can be kept down to very nearly the full load value. The motor is started with resistance in the rotor circuit, which is cut out gradually by means of a drum controller as the motor speeds up. The drum controller and resistance handle only the low voltage rotor current. An oil circuit breaker connects the motor to the high voltage line and automatically disconnects it in case of an overload.

In order to stop the washers and mills quickly in case of emergency, each machine is equipped with a Cutler-Hammer magnetic clutch and brake. Safety switches are located convenient

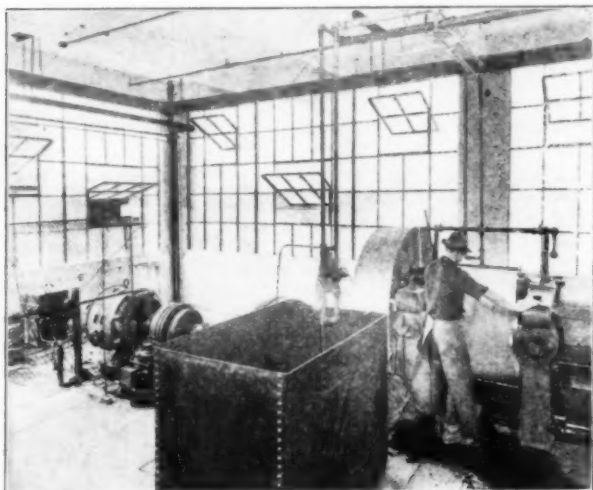


FIG. 1.—HIGH VOLTAGE 100-HORSE-POWER MOTOR DRIVING TWO RUBBER WASHERS.

owing to the fact that large quantities of steam have to be produced for vulcanizing purposes. But electrical engineers have been able to convince several progressive rubber manufacturers that even greater economy lies in another direction and that there are also other attendant advantages. For instance, power for a new and thoroughly modern factory recently erected for the manufacture of automobile inner tubes is not produced at the plant, but supplied by a central station. The advantages claimed for this somewhat unusual service include the saving of the cost of engines, generators, extra boilers and auxiliaries; the ability to obtain power at any time, night or day, without the presence

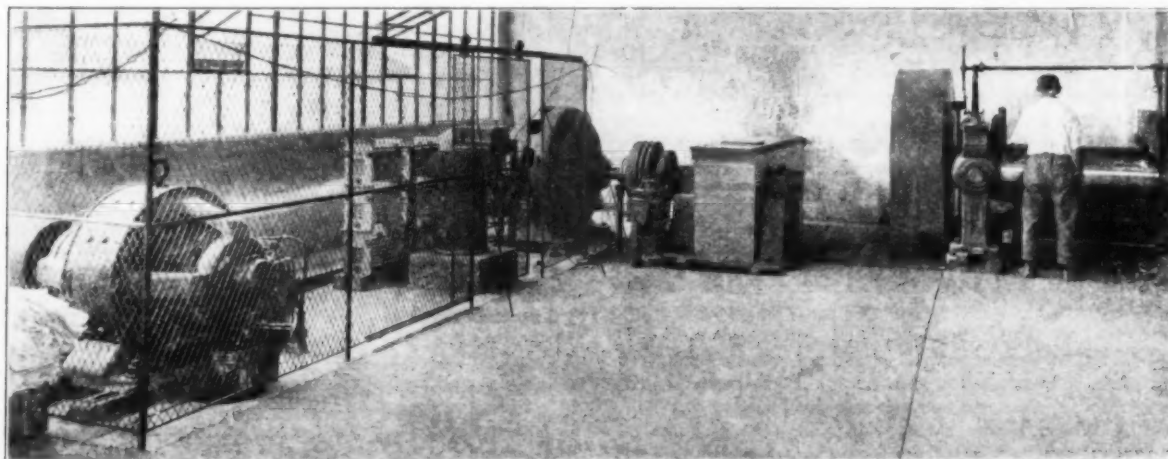


FIG. 2.—GENERATOR SUPPLYING CALENDER MOTOR; ALSO 200-HORSE-POWER MOTOR DRIVING TWO WARMING MILLS.

to each operator and when any one of these is operated, the clutch opens, disconnecting the rolls from the motor, and the brake is applied to the rolls, stopping them almost instantly. Both brake and clutch are operated by direct current supplied by a small motor-generator set.

A 24 x 66-inch Birmingham calender is driven by a Westinghouse 75-horse-power, 230-volt, direct-current motor supplied with current at both 120 and 240 volts from the generator shown in Figure 2. It is evident that it would be less expensive to drive the calender with an alternating-current motor which could take its current directly from the line and thus eliminate the generator; but a direct-current motor is preferable, because there is no practicable method of getting satisfactory speed variation with an alternating-current motor, whereas with a direct-current motor any desired speed range can be obtained. In the present instance the highest speed of the calender is four times its lowest speed and there are 22 steps between, so that every calendering operation can be carried on at the most suitable speed.

Another interesting point is the use of current at two voltages for this motor. It is easily possible to build a motor that will provide a 4 to 1 speed range on one voltage, but such a motor would cost considerably more than the present one, which provides only a 2 to 1 speed range on each voltage; and since the use of two voltages adds but little to the cost of the generator and the controller, a less expensive outfit is provided.

The calender controller, which is of the Westinghouse automatic type, consists of two principal parts: a drum controller and a panel on which are mounted various automatic switches; while on the calender itself are placed "start" and "stop" buttons. When the operator desires to start the calender he moves the drum controller handle to the notch which he knows from experience will correspond to the speed he desires; he then presses the "start" button. The motor now starts and comes up to speed, the magnetic switches on the panel automatically making the proper connections. Should a change of speed be desired, the controller handle is moved in either direction, causing the motor to change its speed to correspond. Pressing the "stop" button not only cuts off the current but causes dynamic braking connections to be made by the automatic switches, which brings the calender to an abrupt stop. Safety switches, operated by means of ropes hanging down on each side of the calender, stop the calender in the same way.

The Royle tubing machines, which form inner tubes, are driven by 20-horse-power, 220-volt, 685-r.p.m., Westinghouse squirrel-cage motors. The drying rolls, the grinding and buffing wheels, and the machine tools in the machine shop are also motor driven.

NEW POLICY OF BUYING RUBBER-COVERED WIRE.

Manufacturers and jobbers are making a better profit in rubber-covered wire today than ever before. The demand is large and the output is not sufficient. Rubber-covered wire, being a staple, never was very profitable for the jobber. Until quite recently it was sold on a basis of the best price. Thus a buyer would place an order at today's prices, say 21 cents, for four months' delivery. If at the delivery date the prevailing price was 18 cents the buyer expected this price and received it, although the contract was made at 21 cents. If, on the other hand, the price had advanced to 23 cents the buyer held to the contract price of 21 cents. The buyer therefore was protected against any advance in the market but he also received the benefit of any decrease in market prices.

Under such a scheme it was nothing more than heads the buyer wins, tails the seller loses. With the margin of profit always small it often reached the vanishing point on a rising market. Today, however, all of this has been changed. Wire is bought at the delivery market price of copper-wire base. The jobber buys this way from the manufacturer and the contractor from the jobber. The benefits of a rising market are now going to the seller. [Electrical World.]

FOREIGN IMPORT DUTIES ON RUBBER SPONGES.

THE accompanying statement of foreign import duties on rubber sponges imported into the various countries given, has been corrected to December 1.

When two or more rates of duty are shown for the same article, products of the United States, as a rule, are admitted at the lowest rate ("conventional" or "minimum"), except: (1) Into France and French colonies, where, in the case of most articles, the "general" rate is applied; (2) Into Canada, where the "general" rate is applied; (3) Into other British colonies, where the "preferential" rates, if any, are withheld from all non-British imports.

While every care has been taken to insure accuracy, the rates are not guaranteed and it is advisable to make small trial shipments to test them. As changes in the duties are likely to occur at any time, frequent verifications are advised. The surtaxes noted in the South American table have not been added to the rate.

FOREIGN IMPORT DUTIES ON RUBBER SPONGES. Rate per 100 Kilos. (220 Pounds.)

| EUROPE: | Weight. | Rate per cent | |
|---|---------|---------------|------------------------------|
| | | General. | Con-vention. ad valorem. |
| Austria-Hungary | Net | \$20.00 | \$16.00 |
| Belgium | Net | ..... | 10 |
| Bulgaria | Net | 58.00 | ..... |
| Denmark | Net | 18.75 | ..... |
| Finland | Net | 11.34 | ..... |
| France | Net | 72.37 | 48.25 |
| Germany | Net | 9.52 | 9.52 |
| Greece | Net | 77.20 | ..... |
| Italy | Net | 9.65 | 9.65 |
| Netherlands | Net | ..... | 5 |
| Norway | Net | 34.84 | 26.80 |
| Portugal | Net | 45.60 | ..... |
| Roumania | Net | 9.65 | 9.65 |
| Russia | Net | 113 | ..... |
| Serbia | Net | 86.85 | 29.00 |
| Spain | Net | 115.00 | 77.00 |
| Sweden | Net | 32.16 | ..... |
| Switzerland | Gross | 7.72 | 4.82 |
| Turkey | ..... | ..... | 52.80 |
| United Kingdom | ..... | Free | ..... |
| SOUTH AMERICA: | | Valuation. | Rate per Kilo. [2.2 Pounds.] |
| Bolivia | Gross | \$1.55 | 25 |
| (Surtax, 2 per cent of official valuation.) | | | |
| Colombia | Gross | ..... | \$1.00 |
| (Surtax, 2 per cent of duty.) | | | |
| Ecuador | Net | ..... | .145 |
| (Surtax, 125.5 per cent of duty.) | | | |
| Paraguay | Net | 4.82 | 42 |
| (Surtax, 1.5 per cent ad valorem, based on official valuation.) | | | |
| Peru | Net | ..... | .729 |
| (Callao, Salaverry, Paita and Pisco, surtax, 10 per cent of duty. Other ports surtax 8 per cent of duty.) | | | |
| Uruguay | Net | ..... | 31 |
| Venezuela | Gross | ..... | .482 |
| (Surtax, 56.55 per cent of duty.) | | | |

* Rate per 100 Okes [2.822 pounds].

† Rate per Funt [14½ ounces].

Compiled by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

AMERICA'S FIRST NAVAL DIRIGIBLE.

The United States Navy's first dirigible balloon, the DN-1, has been shipped to the Naval Aeronautical Station, Pensacola, Florida, for final flying tests, the preliminary power plant and blower tests having been previously passed by the government inspector at the factory of the constructors, the Connecticut Aircraft Co., New Haven, Connecticut.

The DN-1 is of the non-rigid type, the gas bag maintaining its shape by the pressure of the contained gas, and the gondola being suspended by numerous ropes and cables fastened to the "belly-bands" of the bag.

The envelope of the bag is of double-ply rubberized cotton fabric; strength, 70 pounds per inch for both warp and weft; permeability, 35 cubic feet per 24 hours at two feet water pressure. All seams are extra wide, with double rows of stitching. The ballonets are made of double texture fabric; strength, 40 pounds for warp and weft.

All of the fabric, for both main envelope and ballonets, was furnished by the Cambridge factory of the United States Rubber Co., the shaping of the big bags and the setting-up of the balloon being done in the Naugatuck factory.

What the Rubber Chemists Are Doing.

VARIABILITY OF PLANTATION RUBBER IN TECHNICAL MIXINGS.

THE variability of plantation Para rubber, when vulcanized with various technical mixings in addition to sulphur, has been investigated by Eaton and Grantham, Agricultural Department, Federated Malay States. Their results appear in the "Journal of the Society of Chemical Industry," (October 31, 1916). In the experiments described by them zinc oxide, litharge and magnesium oxide with a small percentage of sulphur were used in several combinations. Vulcanization was effected in molds in a steam-jacketed vulcanizer at 140 degrees C. and tests made with ring specimens on the Schopper-Dalen testing machine.

Regarding the stability of their vulcanized samples kept six months or a year before testing, their experiments show that, with the 10 per cent sulphur mixing the rubber continues to vulcanize slowly during six months. This extra vulcanization represents about a quarter-hour cure at 140 degrees C. A certain amount of deterioration in tensile properties also takes place. While the 10 per cent mixing is excellent to ascertain variations in rate of vulcanization between different rubbers, especially when it is required to test the samples shortly after vulcanization, it is not a good mixing for testing the aging properties of different rubbers after vulcanization, because the large amount of free sulphur gradually exudes, leaving the sample porous and easily oxidizable. The authors append their paper with the following conclusions:

1. The variability of plantation Para rubber in respect to rate of cure continues to exist in various technical mixings in which the rubber is loaded with mineral constituents in addition to sulphur, and also in rubber-sulphur mixings containing different proportions of sulphur.

2. The variability is not of the same degree as with mixings containing 8 to 10 per cent sulphur.

3. The use of strong accelerating agents, such as oxide of lead, tends to obscure these differences which are produced in the raw rubber by the presence of a natural accelerator.

4. Other substances, caustic soda and potash and various organic nitrogenous accelerators, also obscure these differences, since these substances behave in a somewhat similar manner to the natural accelerators present in raw rubber.

5. To illustrate the differences in rate of cure between different rubbers, which is the most important variability in plantation Para "first latex" rubbers, and 8 or 10 per cent sulphur mixing, without other addition, is very satisfactory, although not suitable for stability or aging experiments.

SYNTHETIC RUBBER FROM ALCOHOL.

Ostromyslenski's method of producing erythrene rubber is given in "Chemical Abstracts," as follows: The mixed vapors of ethyl alcohol and air are passed through spirals of copper and silver gauze and the products are converted into erythrene by being passed in a gaseous or liquid state through a series of metal tubes containing aluminum oxide heated to 824 to 860 degrees F. Erythrene is converted into rubber in an autoclave containing a small quantity of a catalytic substance. In order to give the synthetic rubber all the properties of natural rubber it is necessary to add to it certain substances found in the latter. These additions amount to about 15 per cent and consist of pure nitrogenous substances, litharge and colophony, or Canada balsam, as a substitute for the resins of natural rubber.

In connection with the above it should be noted that Dr. Ivan Kondakorr, in a communication to "Le Caoutchouc & la Gutta-Percha" (November, 1916), refers to this synthesis as nothing new and to Ostromyslenski's recently published researches as a confirmation of previous knowledge rather than new discoveries.

VULCANIZATION TESTS.

Two reports made by the Imperial Institute to the Rubber Research Committee in Ceylon (Department of Agriculture Bulletin, Ceylon, No. 23), on vulcanization tests of plantation Para, deal with the following points: (1) The effect of different methods of coagulation. (2) The effect of adding ammonia, sodium bisulphite and formaldehyde to latex before coagulation. (3) The effect of the form of the rubber (sheet, crêpe, etc.)

TENSILE STRENGTH.

The maximum tensile strength of 64 specimens was 2,571 pounds, minimum, 1,607 pounds. Two samples of best fine hard Para gave, in comparison, 2,276 pounds and 2,312 pounds. Rubber prepared by spontaneous coagulation has tensile value equal to that coagulated by acids. Scrap rubber shows low tensile strength in every case. The use of different acids for coagulation has little effect on the tensile strength of the rubber produced. Double the usual amount of acid had no marked effect on the tensile strength. The addition of fractional percentages of ammonia, sodium bisulphite or formaldehyde to the latex before coagulation had no marked effect on the strength of the rubber. Hand-made and machine-made sheets seem to give rubbers of practically equal strength. Thick crêpe is slightly higher in tensile strength than thin crêpe.

ELONGATION.

The elongations at heating point ranged from 787 to 919 per cent. Two samples of best fine hard Para gave in comparison, 880 and 893 per cent.

TIME OF VULCANIZATION.

This was tested on a standard mixing of 90 parts rubber and 10 parts sulphur, vulcanized at a constant steam pressure of 50 pounds.

The results are thus summarized:

Hand-made sheet cured more quickly than machine-made. Crêpe cured more quickly than thin crêpe. Thin crêpe required longer to cure than the corresponding sheet.

Rubber prepared from the same sample of bulked latex by coagulation with different acids had approximately the same time of cure. When double the minimum amounts of acid were used, the time of cure was not much affected.

Addition of ammonia and sodium bisulphite to the latex before coagulation had no constant effect on the time of cure, but an excess of formaldehyde lengthened the time very considerably.

Differences in the tensile strengths of washed and unwashed rubber were comparatively small.

RUBBER OF UNIFORM COLOR.

The production of rubber of uniform color has been specially studied by Clayton Beadle and Stevens and their results published in a paper presented at the Congress of Batavia. In brief they find that such rubber can be produced only by the exercise of special precautions in the coagulation of the latex. It is possible to obtain uniformly pale rubber if the latex is rapidly coagulated by an excess of acetic acid, the coagulum rapidly washed in a machine, followed by rapid drying in warm air or in a vacuum chamber. The reason for this is simple.

Rubber latex contains an enzyme, an oxydase which causes rapid absorption of oxygen from the air by the fresh coagulum. This oxygen reacts rapidly on certain organic substances contained in the latex, producing black coloring matters. Color is not an indication of quality, but manufacturers and dealers regard variations of color with suspicion. For this reason large dealers sort their cargoes and repack for external appearances, with no regard to the sources or origin of the rubber.

A method for obtaining rubber of uniform color, originally tried in Ceylon, consists in boiling the fresh coagulum, in pieces the size of one's fist, for 10 or 15 minutes in water. The heat destroys the enzyme and the rubber loses the property of blackening on exposure to the air. While the rubber is pale the boiling makes it sticky and more difficult to dry.

A third method consists in using small amounts of antiseptic substances to arrest the action of the enzyme. Among these, formaldehyde and bisulphite of sodium are commonly used. The percentages required are extremely small. After accomplishing their work they are removed from the rubber by washing in the crepe machines.

Bisulphite of soda has no bleaching action on the rubber itself and is not able to destroy coloring material already formed. It simply prevents the action of the ferment. It is an antiseptic and not a bleaching agent. Vulcanization tests show that rubber prepared with an excess of acid is inferior to that prepared with the minimum of acid. The same is true of boiled rubber. Rubber treated with bisulphide loses nothing of its quality and is scarcely distinguishable from untreated rubber.

BLEACHED RUBBER.

The influence of hydrosulphites on strongly colored crêpes has been studied by André Dubosc (*Le Caoutchouc & la Gutta-Percha*). The rubber was subjected to the action of sulphonyl aldehyde of sodium, both hot and cold. Decoloration was more rapid under the former condition, especially in the presence of a small quantity of bisulphite of soda. Air dried, the samples do not remain absolutely white, but turn yellowish, although much paler than the initial color.

Sulphonylates, and in general all the hydrosulphites, act on the coloring matter of rubber and by hydrogenation transform it into a leucobase, even if the coloration is old.

The accidental coloration, observed by Stevens and Clayton Beadle in the coagulation of latex, Dubosc concludes, can be more advantageously controlled by a hydrosulphite of sodium aldehyde or a sulphonyl aldehyde.

STABILITY AND THE OPTIMUM CURE.

The views expressed by Dr. H. P. Stevens on the stability of vulcanized rubber and the "optimum" cure (*THE INDIA RUBBER WORLD*, October, 1916), are discussed adversely by Philip Schidrowitz and H. A. Goldsborough in "*The India Rubber Journal*" (October 28, 1916). They maintain the value and accuracy of their "correct" cure method of crude rubber valuation, as applied for technical purposes. With regard to "correct" or "optimum" cure in relation to aging, the authors state that the results of their experiments may be summarized as follows:

Standard mixture, 100 parts smoked rubber, 8 parts sulphur.

1. *Series stored over 15 months.* The samples most closely approximating to the "correct" cure showed less variation than the samples which were obviously under or over-cured, taking the "correct" cure tested 24 hours after vulcanizing as standard.

2. *Series stored over 8 months.* In three cases out of four a distinct improvement in "tensile product" was observed. None of the results indicate over-cure.

3. *Short period series.* Variation in the rest period between mixing and curing showed some, but relatively slight effect. The shorter the rest period, the slower the rate of cure.

Variation in the rest period between curing and testing exercises an appreciable effect on results during, approximately, the first 12 hours, but after that the alteration in properties is slow. The results are in keeping with practical experience on these points.

Investigation of the relation of combined sulphur to "correct" cure indicates that the former stands in no relation to mechanical properties.

"CORRECT" VS. "OPTIMUM" CURE.

The authors' original paper on the determination of "correct" cure will be found in "*The Rubber Industry*," 1914, page 214. In

brief their method is: (1) Vulcanization is physically and mechanically of a definitely progressive character. Its progress can be accurately expressed graphically by a series of stress-strain curves. (2) From the formula corresponding to the curves it is possible to select that curve, in a series, which represents an ideal balance of tensile properties. (3) The cure corresponding to such a curve is in fact the "perfect" or "correct" cure under given standard conditions of mixing, curing and testing. The method is scientific; admits of exact measurement, and is independent of any serious experimental error.

Eaton and Grantham's "optimum" cure is that cure which gives the highest figures for the "tensile product" (breaking strain and elongation at break). The method may yield erroneous results, mainly on account of the fact that on both sides of the "correct" cure, but particularly on the over-cured side, there is a region in which the "tensile product" may be equal to or greater than that of the "correct" cure. Since similar results may be obtained for a number of cures by this method, it may be impossible, in practice, to decide as to which cure, over a range perhaps of an hour or more, may actually represent the "optimum." The method gives no definite indication of the state of cure and is dependent on the uncertain character of the "break" and "elongation" figures.

RUBBER TESTING IN JAVA.

The Central Rubber Station for the Netherlands Indies, at Buitenzorg, Java, in charge of Dr. O. de Vries, is equipped for research and testing purposes, especially for the study of rubber preparation methods and testing samples for control and improvement of work on the estates. The Bulletin of the Station is distributed by application to the director.

Dr. de Vries in a lecture before the Malang Planters' Association, at Malang, discussed the preparation of plantation rubber and the need for research, considering the relative position of the two principal forms, smoked sheet and crêpe. Generally, smoked sheet has a quicker rate of cure than crêpe. The tensile strength of smoked sheet need not be below that of crêpe, and it is often found to be higher, due to not overworking the coagulum as in the case of making crêpe. Smoked sheet is inferior to crêpe in the matter of uniformity, due to the method of preparation. Crêpe in Java is generally prepared on older estates, with a long experience and well-regulated routine, whereas sheet making is often undertaken on estates just starting manufacture and, in consequence, the product is not so carefully controlled. The preparation of crêpe is practically a mechanical process while the preparation of sheet is still often complicated by the large number of small pans and much hand making. There are also irregularities in drying and smoking, so that the method of preparation affords much more chance for variation. There can be no doubt, however, that it is possible to produce sheets of very uniform quality.

The excessive rise in price of acetic acid has stimulated research with other coagulating material. Sulphuric acid has been tried and it has been found that slight variations in the amount used have an appreciable influence on the quality of the rubber, notably on its rate of cure. Sugar as a coagulant, according to some experts, is likely to cause much variation in the rate of cure, owing to bacterial action in the latex, dependent on the weather during tapping.

EXTRACTING DEAD HEVEA LEAVES.

Negative results were obtained by J. C. G. Vriens in the extraction with benzene of the dead leaves which were still on the *Hevea* trees before the normal leaf fall. [Chemical Abstracts.]

WHALE OIL AS AN ACCELERATOR.

In referring to the suggested use, by Marill, of whale oil as a vulcanization accelerator, André Dubosc remarks in "*Le Caoutchouc & la Gutta-Percha*," that the crude oil containing sperma-

ceti is indicated, and adds that spermaceti contains a larger proportion of cholesterols, organic alcohols which are found in the unsaponifiable caoutchouc resins and which play an important part in vulcanization by aiding the change of the sulphur to hydrosulphuric acid. As pure whale oil is composed largely of oleine, margarine, cetine and phocenine, it is changed, during vulcanization, partly, at least, into rubber substitute.

CHEMICAL PATENTS.

THE UNITED STATES.

SHOE BOTTOM-FILLER. A plastic spreadable mass consisting of a gelatinous, adhesive cement binder having a resinous component and containing coagulated oil in a fragmentary condition. When molded into a thin layer in a shoe-bottom it sets quickly, forming a permanent, waterproof and highly resilient cushion, strongly adhesive and cohesive in character, and yielding freely in all directions to pressure without disturbing its cohesiveness. [Andrew Thoma, Cambridge, Massachusetts, assignor to the North American Chemical Co., a corporation of Maine, United States Patent No. 1,203,435.]

SELF-HEALING COMPOSITION. A composition for the inner tubes of tires, comprising reclaimed rubber, pine tar and palm oil, the mixture having a dense semi-plastic, semi-elastic, tacky consistency free of pores and retaining these properties when heated in contact with rubber containing sulphur. [James P. Claire, Stratham, New Hampshire, United States patent No. 1,206,414.]

PROTECTIVE COATING. A composition consisting of liquid gutta-percha, 20 per cent; benzine, 15 per cent; ether, 25 per cent; rye flour, 20 per cent, and plumbago, 20 per cent. [Walter Schermerhorn, Omaha, Nebraska, United States patent No. 1,204,697.]

THE DOMINION OF CANADA.

WATERPROOFING COMPOSITION. A composition of grease, wax and rubber. [Joshua D. Trenaman, Hamilton, Ontario, Canada, Canadian patent No. 171,770.]

THE UNITED KINGDOM.

TREATMENT OF LATEX AND RAW OR SCRAP RUBBER. The removal of proteins and soft resins is effected by treatment, without heating, with mixed solvents, alcohols and any form of oil spirit, such as benzine or naphtha. The solvents may be applied as a vapor or spray in a specified apparatus. The precipitated rubber rises and is separated. The benzine which is absorbed by the rubber dissolves the soft resins and soluble proteins, but scarcely affects the hard resins and insoluble proteins which it is desired to retain. During the crepeing most of the dissolved resins and proteins are expressed. About 5 to 10 per cent of benzine remains in the rubber. [C. A. Ilcken, British patent No. 8,487 (1915).]

SUBSTITUTES FOR EBONITE AND HORN. Treatment of yeast with formaldehyde or other aldehyde. As an example, 1,000 parts of yeast pulp containing 15 per cent of dry substance are mixed with an aqueous solution of 20 parts of blood albumen and coagulated by boiling. The precipitate is mixed with 175 parts of a 40 per cent solution of formaldehyde. The mixture is dried and mixed with 10 parts of powdered glue, to which may be added 75 parts of colophony and 8 parts of celluloid. The mixture is dried and molded at a temperature above 95 degrees C. and a pressure above 150 atmospheres. [H. Blucher, 31 Hardenberg strasse, Leipzig, and E. Krause, E. 6 Sedan strasse, Steglitz, near Berlin, Germany, British patent No. 11,563 (1915).]

GOLF BALLS. Gutta-percha, rubber or other material, with center or layers incorporated of a radioactive substance, such as pitch blend, etc. [E. Miller, E., 167 Oxford street, London, British patent No. 11,509 (1915).]

INDIA RUBBER. Latex is coagulated by treatment with the gases from the destructive distillation of wood after removal of the tar from the gases. [E. C. R. Marks, 57 Lincoln's Inn Fields, London, British patent No. 11,615 (1915).]

LABORATORY APPARATUS.

FREAS ELECTRIC OVENS—IMPROVED.

TWO new types of Freas electric ovens are now available. One is designed for drying a large number of samples simultaneously, or samples containing considerable moisture. It is provided with a flue in the back wall above which is placed a centrifugal fan driven by a motor supported on the outside of the oven. This arrangement provides forced circulation of heated air, and a forced withdrawal of moisture-laden air, thereby creating more perfect conditions and shortening the time required for drying. Another type is fitted with a cast aluminum perforated plate, which is revolved in the oven chamber by means of a motor. This arrangement subjects the various samples to be tested (which are placed on the revolving shelf) to the same constant temperature. [Eimer & Amend, New York City.]

FILTER PAPERS.

The short supply of German filter papers for analytical work has brought out a series of a dozen Whatman grades of this stock of English manufacture, which are taking the place of the well-known Schleicher and Schnell filter papers. All of the Whatman grades are guaranteed free of starch and chlorine and are put up in sealed boxes. [Eimer & Amend, New York City.]

TABLE TOPS.

A very practical top for laboratory tables that has been in use for the past five years at Dakota Wesleyan College, is described by H. I. Jones in the "Journal of Industrial and Engineering Chemistry." It consists of ordinary soft pine flooring on which are laid two sheets of tar paper, covered with large sheets of asbestos slate one-eighth inch in thickness. The asbestos is screwed on, the holes being countersunk and filled above the screw head with asbestos cement. Every year the table tops are treated with a gasoline solution of paraffin sufficiently concentrated to set to a jelly consistency when cold. The solution is brushed on hot. This paraffin treatment gives a polish but is really unnecessary and adds nothing to the serviceability. This style of top has the advantages of low first cost, long life, and ready application by anyone. It is so poor a conductor of heat that even thick glass containing hot liquids may be set upon it without breaking.

IMPROVED TEST TUBE AND FLASK BRUSH.

An improvement on the familiar sponge-end bristle test-tube cleaner is found in the "Dolbey," a patented brush of long fiber which fills and cleans thoroughly the inner surfaces of test-tubes and flasks. [Edward P. Dolbey & Co., Philadelphia, Pa.]

GOGGLES FOR FACTORY USE.

Rubber makers regularly engaged in buffing vulcanized rubber might profitably use the style of protective goggle described by J. R. de la Torre Bueno, of the General Chemical Co., in the "Journal of Industrial and Engineering Chemistry." His suggestion for the ideal goggle provides for, (1) perfect protection for the eye, (2) large field of vision, (3) comfort. The frame or mask should be of flexible wire netting with flexible edges bound with soft rubber tubing to conform to the facial contours. The glasses should be large and held in well-ventilated rubber settings to prevent condensation of moisture and clouding.

According to the military correspondent of the "Lokal Anzeiger," Berlin, Germany, the booty taken by General von Falkenhayn's forces at Crajova comprised oil, benzine and rubber in quantities that exceeded expectations.

New Machines and Appliances.

THE SCOTT AUTOGRAPHIC TESTING MACHINE.

THE natural advancement in the manufacture of textiles and mechanical rubber goods has required a more thorough knowledge of the materials used and of the effects of various processes through which these materials pass in the course of manufacture. Especially is this true in the manufacture of tires, as

the success and life of a tire is by no means determined by its initial strength, but quite as much by its ability to retain its strength and resiliency.

The testing machine plays a very important part in determining the materials best suited for the desired results. In fact, the success that has been attained by manufacturers who have used the tensile strength tester intelligently has led them to further efforts along this line until the manufacturer of the testing machine has been called upon to produce a tester that will meet the most exacting requirements.

The accompanying cut shows one of the latest models that will automatically test rubber, tire fabric or other materials and write the result upon a standard letter-head. It will make tensile, elasticity, friction and other types of tests in general use.

It is mounted upon two heavy iron rail frames and is designed to be fastened to the wall in a vertical position. It can be driven by an electric motor insuring constant speed and uniform results. The draw bar, or stretching screw, is of special high-carbon steel $1\frac{1}{4}$ -inch diameter and has a movement of 48 inches. It is operated by a heavy bronze nut and passes through the gear box without revolving. The downward or stretching stroke is made by direct gearing, allowing no chance for slip or speed variation. An automatic reverse brings the moving clamp back at high speed.

The speed of stretch may be varied by a back gear arrangement to reduce from 20 to 2 inches per minute. This provides for "friction" tests on hose, belting packing, boot tops, etc.

The autographic charting device works automatically and may be used to chart both stretch and strength tests, and by pressing a button on the side of the recorder it will produce a magnified or enlarged chart of "friction" tests. All charts are developed on standard letter paper held flat by two rubber rollers. The line is drawn by red ink from a pen operating across the sheet as the platen moves downward in ratio with the movement of the stretching screw. Several tests may be recorded on the same sheet and comparisons made of various samples. The sheet can then be placed in a typewriter for further data or filed in the usual way.

Rubber and fabric clamps, as well as spools with cleats for holding cords, etc., are furnished and are quickly interchangeable. An elasticity measuring device is attached to the frame of the machine and the length of stroke and distance between clamps may be varied by adjustment collars on the vertical con-

trol rod. When once set the machine will automatically stop and reverse at the same position with every test.

The recording head is simply but strongly built and has no delicate parts to get out of order. Its accuracy may be proven at any time without the use of special mechanism. The dial is of white celluloid with black figures and can be easily kept clean. The pointer indicates the maximum pull required to break the sample and remains in this position until reset by the operator. This is accomplished by means of a novel device requiring very little effort. [Henry L. Scott & Co., Providence, Rhode Island.]

THE SQUIRES BATHING CAP MACHINE.

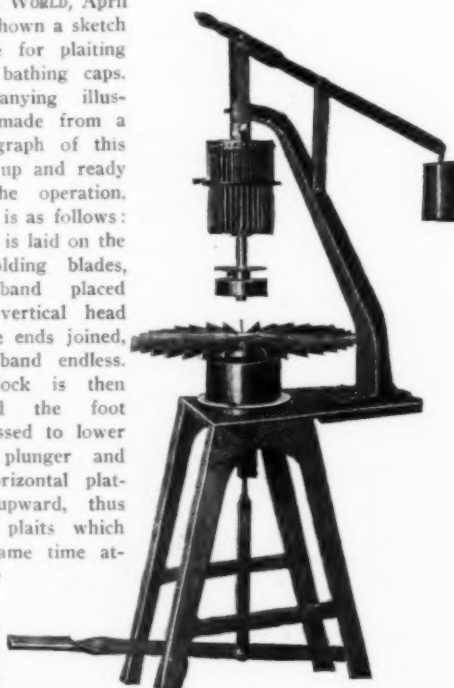
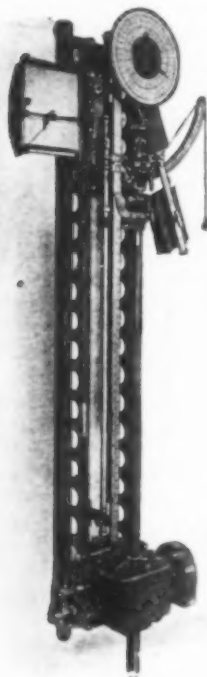
That bathing caps are becoming more popular each season is demonstrated by the increasing demand for them. In an article on bathing cap machines that appeared in *THE INDIA RUBBER WORLD*, April 1, 1916, was shown a sketch of a machine for plaiting and forming bathing caps.

The accompanying illustration was made from a recent photograph of this machine, set up and ready for use. The operation, briefly stated, is as follows: The cap body is laid on the horizontal folding blades, the head band placed around the vertical head block and the ends joined, making the band endless. The head block is then lowered and the foot treadle depressed to lower the hollow plunger and force the horizontal plaiting blades upward, thus forming the plaits which are at the same time attached to the head band. The treadle is then released, allowing the horizontal

blades to resume their original position. The cap now being folded over the blades of the vertical head block, a ring, to which the blades are attached, is moved to the right, which folds the plaits one upon the other. After attaching this outside head band and trimming, the cap is then removed from the machine. It is claimed that an operator of ordinary intelligence can make one complete bathing cap a minute on this machine. [The S. & W. Rubber Manufacturing Corporation, College Point, New York.]

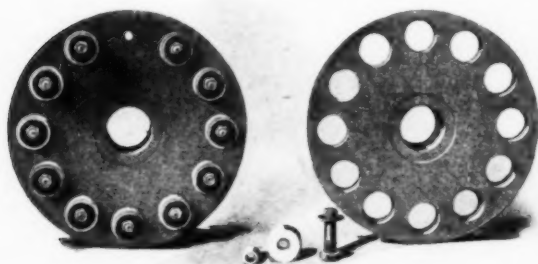
THE FAWCUS FLEXIBLE COUPLING.

The unusual strains and sudden shocks to which rubber mill lines are subjected, frequently result in broken gearings, fractured shafts and damaged bearings. For that reason a flexible coupling that will absorb shocks and permit a certain amount of shaft misalignment is considered a necessary part of the mill room equipment. The pinion shaft of a double helical gear drive should, moreover, be connected to the driving shaft by a



balanced flexible coupling that will allow an adequate amount of free axial movement between the two parts of the coupling.

The illustration shows the Fawcus coupling that is designed to meet the particular requirements of rubber mills and mill drives.



It consists of two flanged castings machined all over, one carrying steel pins and the other having rubber-bushed holes into which the pins slide freely. The bushings are made of pure compound and bushed with brass.

These couplings are made of cast iron or steel, in ten sizes, constructed to transmit with safety the required horse-power. [Fawcus Machine Co., Pittsburgh, Pennsylvania.]

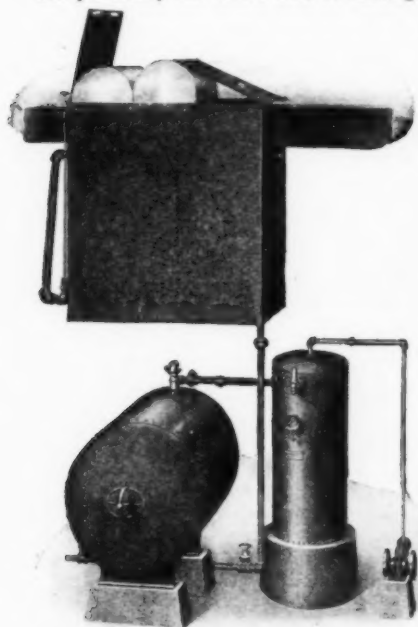
THE LUMMUS CAUSTIC SODA DISSOLVER.

Most concerns interested in recovering rubber by the alkali process continue to dissolve caustic soda in the old-fashioned way, despite all the disagreeable inconveniences and dangerous work of breaking up the cakes, handling and stirring them in some suitable receptacle to which steam is piped for heating water. Not only can these troublesome operations be avoided, but practically the entire cost of making the stock solutions of

caustic soda may be eliminated by the use of the automatic caustic soda dissolver, illustrated herewith. This was devised by the superintendent of a chemical works who appreciated the fact that his men were often laid off for a day or so because of caustic soda burns.

This dissolver operates without steam for heating the water or power for stirring. Solution is effected by taking advantage of certain properties of solutes, accomplishing the desired result more quickly than is

possible even with the use of hot water in the old method. The operation of the dissolver is exceedingly simple. The thin iron drums are stripped from one or more cakes of the fused caustic, which are then rolled without breaking on the grid of the hopper. The dissolver is then filled with cold water to within a few inches of the curb and the safety doors are inclined against the cakes so that they

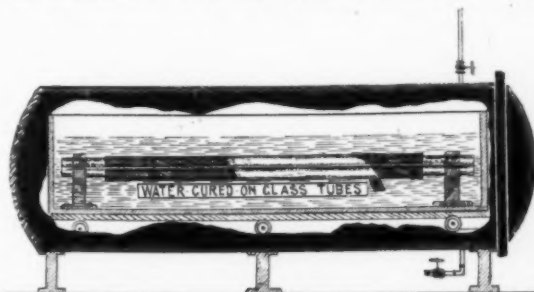


will close as the cakes melt down. The balance of the operation proceeds automatically, without further attention. The strength of solution can be controlled by a device in connection with the circulating system which may also be adjusted to suit individual requirements. This device has been on the Boston market for several years, but has not become generally known. It is claimed to be a money saver, and it gives the works manager assurance that the stock solution will be ready at a regular time each day. [The Walter E. Lummus Co., Boston, Massachusetts.]

INNER TUBES MADE ON GLASS POLES AND WATER CURED.

In ordinary practice, an inner tube is built up by wrapping a sheet of rubber stock around a mandrel, which is then placed in a horizontal vulcanizer and cured in open steam. What is said to be an improvement on this method, in that it produces smoother tubes, consists in covering the mandrels with hard rubber and vulcanizing in hot water. A variation of this is the use of glass mandrels.

The hot-water process, while not a novelty, has advantages in the manufacture of certain goods, particularly inner tubes,



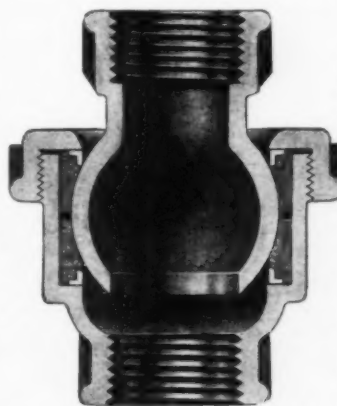
where a soft, smooth finish is desired. Moreover, water curing is a non-burning process.

According to the S. & W. method illustrated here, the stock is built up on glass poles and instead of the usual cloth wrapping, the tubes are covered with a seamless circular woven cotton jacket. The poles are then placed in a suitable tank mounted on a truck, which is rolled into an ordinary horizontal vulcanizer. The tank is filled with cold water, the vulcanizer head closed and live steam turned into the heater until the cure is completed.

THE BARCO FLEXIBLE JOINT.

Vulcanizing presses of the single or multiple platen types are all dependent upon swing joints or some type of universal connection in the steam supply line. Moreover, there are many

other rubber machines that are operated by compressed air or hydraulic pressure where flexible connections are necessary. A flexible joint that will permit movement of the adjacent parts and at the same time remain tight under steam or air or water pressure is interesting.



The joint here illustrated may be used wherever steam, air, oil, water, gasoline, and other liquids are to be conveyed through a flexible or movable connection. It is particularly appreciated in manufacturing operations where the service is severe and where interruption in the use of the machine through defective connections is a serious matter.

The joint consists of a ball set in a casing and surrounded by two non-metallic hard gaskets, which contact both with the ball and casing, and allow the ball to move in an angular or rotary movement, while the two gaskets are held in place by a locking nut. The whole construction is very simple and the great success of the joints is due to the application of the gaskets to the ball, and the material of which these gaskets are made.

The joints are made in a large variety of sizes and shapes and they can be applied to almost any condition arising in the manufacture of rubber goods. [Barco Brass & Joint Co., Chicago, Illinois.]

THE SQUIRES BUCKET-TYPE STEAM TRAP.

In conjunction with vulcanizing presses for mold work, the bucket-type steam trap is generally recommended. If the steam pressure is the same for each press, it will be possible to operate several presses on one trap of suitable size, but five presses operating at 80 pounds and five at 60 pounds, for instance, would require a separate trap for each group. Sometimes the trap valve is opened or closed to increase or decrease the circulation speed and in this instance an individual trap is preferable.

The accompanying illustration is a sectional view of a well-known type of the bucket steam trap. It has one inlet, two outlets and two blow-off connections. The pipe connections can be made on either side, whichever may be most convenient, leaving the other side plugged. After installing the trap there should be enough water in it to float the bucket, as the valve does not seat until the bucket is up. As soon as sufficient water enters the trap, the bucket, being buoyant, rises and closes the valve, which is attached to it by the valve stem. When condensation in the trap body has reached the high-water line the bucket fills and sinks, opening the valve which discharges the water in the bucket, leaving enough to insure a perfect water seal, together with the condensation in the trap body through the valve port to the outlet until it has reached the low-water line.

Much difficulty may be avoided by giving steam traps due attention; for instance, blow out the trap as often as the condition of the water makes it necessary. If the trap becomes clogged with mud, caused by the boilers priming, the plug on one of the blow-off connections may be removed and the settling chamber cleaned out with a rod, without disconnecting the piping. [The C. E. Squires Co., Cleveland, Ohio.]

MACHINERY PATENTS.

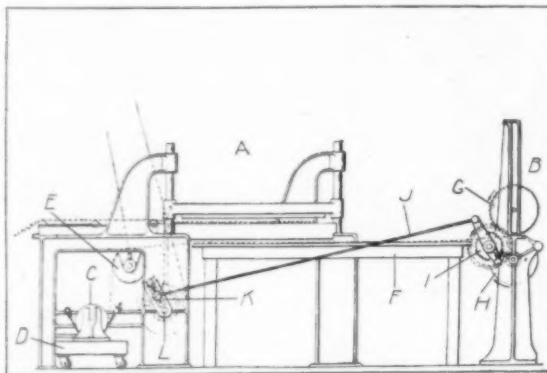
THE STEVENS BIAS CUTTER TAKE-UP.

THE inexpensive and tedious operation of removing strips of frictioned fabric from the bias cutter and placing them in "books" is entirely obviated by this machine. A traveling liner is provided upon which the strips fall, and which is wound up with them in a compact roll.

In the drawing, *A* represents a bias cutter of the ordinary type and *B* the take-up device. The liner roll *C* is mounted on a truck *D* that may be rolled out and a new liner roll replaced. From the

roll the liner passes up over an idle roller *E* and then under the cutter and over the table *F*. This table is long enough to accommodate several strips of fabric for inspection or measurement prior to being rolled up.

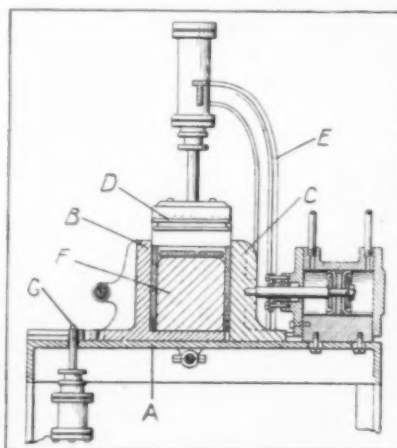
The wind-up machine comprises two standards, provided with vertical slots or guides for the journals of the take-up roller *G*.



Directly below the roller is a drum *H*, the surface of which is roughened and drives the take-up roller by contact. The drum is rotated intermittently by gearing and a pawl and ratchet wheel movement shown at *I* and actuated by rod *J*, attached to crank arm *K*, which is driven from the main shaft *L*. In operation, the bias strips as they are cut off fall on the liner strip and are carried to the rear of the machine where they are rolled up with the liner on the wind-up roller. [William C. Stevens, assignor to the Firestone Tire & Rubber Co.—both of Akron, Ohio. Canadian patent No. 169,455 (1916).]

MACHINE FOR MAKING STORAGE BATTERY JARS.

This machine makes seamless storage battery jars with reinforced corners from sheets of uncured rubber. The drawing is a vertical section through the center of the machine, which is supported on suitable legs not shown.



The bed *A* supports the four horizontally movable rams, only two of which, *B* and *C*, are shown. These are operated by compressed air with the exception of *B*, which is hand operated. The vertical ram *D*, also air operated, is supported with its cylinder by a yoke frame *E* that is bolted to the bed.

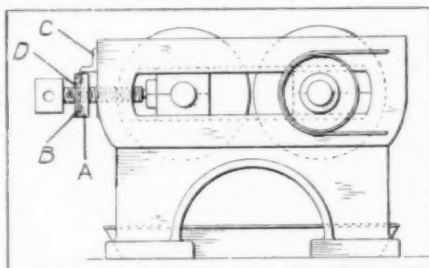
In operation, the sheets of stock which are cut to size and covered with thin sheets of tin, are applied to the mandrel *F*, which is placed on the tongue projecting from the hand-operated ram *B*. This is moved forward under the vertical ram where it is held in position by the air-operated locking pin *G*. The air valve is now operated, advancing the rear ram, then the two side rams and finally the upper ram, thereby molding the sheets of stock on the core and forming a jar without seams or joints.

The air valve is then reversed, which withdraws the locking pin and retracts the several rams, when the mandrel and jar

may be removed from the machine and placed in the vulcanizer. [Theodore A. Willard, Cleveland, Ohio. United States patent No. 1,207,673.]

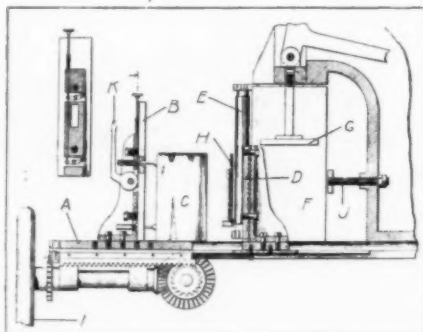
ROLL ADJUSTMENT INDICATOR FOR MILLS.

Imperfect roll adjustment of washers, mixers and warming mills is very often the cause of trouble in the mill room. If the rolls are not parallel and spaced a definite distance apart, the result will be poor batching and often serious damage to the machine. The present invention provides a very simple means for preventing these difficulties. As shown in the drawing, this consists of collars *A* mounted on each adjusting screw and formed of two halves detachably secured together by a screw *B*. The periphery of each collar is provided with spaced circular lines scored around the collar, that register with pointers *C*, attached to each mill frame. The rolls are first brought into contact with each other and the collars then adjusted longitudinally so that the outer faces *D* are flush with the ends of the pointers. The adjusting screws are then backed out sufficiently from the mill frames to provide the necessary space between the rolls. This movement causes the circular scale marks on the collars to become visible beyond the pointers and indicate the space between the rolls. [George E. Nettleton, assignor to The Hartford Rubber Works Co., both of Hartford, Connecticut. United States patent No. 1,206,894.]



STORAGE BATTERY JAR MOLDING MACHINE.

This machine is designed for making battery jars or similar articles by folding sheets of rubber stock around a suitable core. The drawing is a sectional detail through the center of the machine showing the principal parts. These are supported on the table *A* and comprise a front presser plate *B*; a core *C*; a rear presser plate *D*; two vertical folding rollers, one of which is shown at *E*; two side presser plates, one being shown at *F*; and a top presser plate *G*.



The operation is briefly as follows: A sheet of rubber *H*, having on one side a thin sheet of tin, is placed in the opening between the vertical folding rollers, while another sheet is placed on top of the core to form the bottom of the jar. The hand wheel *I* is then operated, moving the front plate and core forward between the rollers that fold the sheet around the sides of the core, which is forced against the back presser plate. The ends of the rubber sheet are folded around the front of the core by an alternate right and left movement of a hand lever controlling the transverse movement of the folding rollers. By

means of the hand wheel, the front and back presser plates, with the core and partly finished jar, are moved still further forward until directly under the top presser plate, when the movement is arrested by stop *J*. Foot levers, not shown, are now operated together with the cam lever *K* to force the front plate forward, the side plates inward and the top plate downward, thereby molding the jar. The core and jar are subsequently removed from the machine for vulcanizing. [William H. Weitling, College Point, New York, assignor to American Hard Rubber Co., New York City. United States patent No. 1,205,940.]

MACHINE FOR WRAPPING HOSE. Strips of frictioned fabric are spirally wrapped under tension around hose or similar articles without using a stiffening core or mandrel or distorting the article being wrapped. [Henry Z. Cobb, Winchester, Massachusetts, assignor to Revere Rubber Co., a corporation of Rhode Island. United States patent No. 1,204,342.]

INNER TUBE RAG WRAPPING MACHINE. This is really a double lathe with parallel centers. The pole and uncured tube are placed in the back lathe, and the pole with the spirally wound fabric strip is placed in the front lathe. The strip is spirally delivered from one pole to the other by revolving both poles in the same direction. After curing, the strip is unwound from one pole and wound up on the other in the same machine. [John A. Vey, assignor to Continental Rubber Works, both of Erie, Pennsylvania. United States patent No. 1,204,213.]

TIRE TREAD CEMENTING MACHINE. This applies a coating of cement to the buffed surfaces of tire casings prior to applying the tread bands. [John M. Hibner, assignor to Morgan & Wright, both of Detroit, Michigan. United States patent No. 1,205,203.]

YARN IMPREGNATING APPARATUS. This comprises a U-shaped solution tank in which the threads to be impregnated are immersed for a considerable period, the surplus liquid removed from the threads, which are then delivered to the twisting apparatus. [Walter R. Denman, assignor to The Miller Rubber Co.—both of Akron, Ohio. United States patent No. 1,206,420.]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

- 1,205,120. Machine for trimming the overflow from molded articles. F. L. Valpey, Swampscott, Mass.
- 1,205,599. Repair vulcanizing device. T. E. Dempsey, New York City.
- 1,206,255. Electrical repair vulcanizer. E. E. Rose, Swissvale, assignor to Westinghouse Electric & Manufacturing Co., East Pittsburgh—both in Pennsylvania.
- 1,206,530. Strip forming machine for automobile tire treads. W. A. Gordon, Shelton, assignor to Birmingham Iron Foundry, Derby—both in Connecticut.
- 1,206,799. Vulcanizing apparatus for boots. H. E. Bast, Lawler, Iowa.
- 1,207,117. Vulcanizing device for tire casings. C. S. Wood, Chicago, Ill.
- 1,207,641. Tire chuck. C. P. Seeger, St. Louis, Mo.
- 1,208,184. Tire adjusting apparatus. F. D. Mayer, Chicago, Ill.
- 1,208,399. Device for automatically coating yarn elements from which a laminated cohesive interwound fabric is constructed. L. A. Subers, East Cleveland, Ohio.

THE UNITED KINGDOM.

- 10,382 (1915). Latex coagulating apparatus. W. G. Lange, ten Houte 'de, 9 Kanarilaan, Bandoeng, Java, Dutch East Indies, and C. Bosman, 16 Forstraat, Haarlem, Holland.
- 11,439 (1915). Winding fabrics. F. Iddon, Glen Maye, School Lane, Leyland, Lancashire.
- 11,601 (1915). Vulcanizing mold. W. J. Mellersh-Jackson, 28 Southampton Buildings, London.

THE FRENCH REPUBLIC.

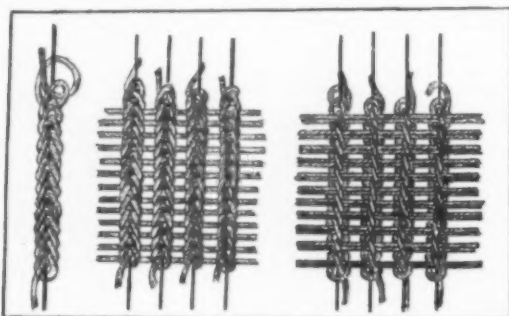
- 480,814 (January 31, 1916). Improvements in processes and apparatus for covering metallic wires, insulated or otherwise, with fibers, textiles, to make electric conductors and for other industrial applications. Société Electro Cable.

PROCESS PATENTS.

ELASTIC FABRIC AND PROCESS FOR ITS MANUFACTURE. In manufacturing elastic fabrics for use in making suspenders, masks for protection against asphyxiating gas, etc., the rubber threads are dressed, that is, tightly enclosed in a sheath of fabric. This holds the rubber while it is stretched, in the course of manufacture, and prevents it from relaxing totally, the object being to give nerve to the rubber.

In the new process, however, the rubber threads are dressed at the same time the fabric is woven, thus saving the preliminary operation of dressing the rubber threads.

It consists in forming, with a textile thread, a small chain on a rubber thread, which constitutes the core of the chain. If the rubber thread is more or less stretched during this operation it will have more or less nerve and if several of the chains are disposed side by side, and connected by one or more weft threads, the result will be a fabric that is lengthwise elastic.



The little chain is shown in the drawing on the left and is made on a passementerie loom of the needle or chainette type. The rubber threads coming from a bobbin pass through holes placed equally distant from one another in a guide-bar in front of the loom. The bar is arranged above the needles and the rubber threads running through it are separated from one another by the distance or interval between two consecutive needles. The rubber threads are placed between each needle and the guide-bar and are animated with an even, to and fro movement, which is adjusted so that each rubber thread passes alternately after the formation of a link, to the right and to the left of the corresponding needle. The result is, the chain is formed around each rubber thread and the weft joining the chains to one another goes through each of the links of the little chain.

As each little chain is made up of three strands, the weft threads, passing through the chain, leave two strands on one side and one on the other side and, after shrinkage, the fabric would be unbalanced. To correct this, a weft thread is passed on each side of the rubber thread, single weft on the side where there are two strands, and double weft on the side on which the strands of the little chains are single.

Thus in the center drawing will be seen the face of the fabric with two strands and one warp, while the reverse side with single strands and double warp is shown on the right. [Louis Brun. French Patent No. 480,735 (1916).]

VENTILATED RUBBER GLOVE. Flutes or air passages are molded in the glove, extending along the backs of the fingers and thumb to points beyond the wrist. [John C. Gibson, Akron, Ohio. United States patent No. 1,206,102.]

OTHER PROCESS PATENTS.

THE UNITED STATES.

- 1,204,609. Dental rubber composition and art of manufacture. S. G. Supplee, East Orange, N. J., and C. J. R. Engstrom, Los Angeles, Calif.
1,204,816. Belting composed of wire coils, non-metallic pins, and a rubber filler enclosing the coils and pins. E. Pattee, Santa Cruz, Calif.

- 1,204,976. Process for constructing endless belts and molds therefor. F. Hall, Newark, Ohio.
1,206,914. Process of manufacturing rubber boots. R. B. Price, New York City, assignor to Rubber Regenerating Co., Mishawaka, Ind.
1,206,920. Plastic composition comprising a mass of rubber and a multitude of short untwisted textile fibers. J. R. Sabford, Salisbury, Conn.
1,207,293. Process of fitting hard rubber jars to storage battery boxes. C. Hodge, Radnor, Pa.
1,207,294. Method of repairing tire casings of the clincher type. O. F. Hungerford, assignor of one-fourth to C. E. Crookston—both of Middleville, and three-fourths to B. M. Soule, Grand Rapids—both in Michigan.
1,207,372. Process of making rubber water bottles. M. B. Clarke, Canton, Ohio.
1,207,709. Fabric for tires. L. J. Campbell, Chicago, Ill.

THE UNITED KINGDOM.

- 11,229 (1915). Shoe soles. T. C. Redfern, Dawson and Springbank streets, Hyde, Cheshire.

MISCELLANEOUS PATENTS.

A SECTIONAL RIM. Briefly, this comprises an annular base rim with side flanges; two flange rings adapted to co-act with a clincher or straight-side tire; a movable wedge-shaped key piece held in place by a spring latch. [Ernest Hopkinson, East Orange, New Jersey. United States patent No. 1,204,019.]

INTERNAL TIRE PUMP. For maintaining tire pressure a block of soft vulcanized rubber with molded air chamber, air passages and valves is placed between the inner tube and casing, and cemented to the former. The depression of the tire casing and the resiliency of the rubber block jointly pump air into the tire. [Henry F. Molkenbur, St. Paul, Minnesota. United States patent No. 1,207,427.]

CONTAINERS FOR TIRE REPAIR MATERIALS.

Auto-repair kits have grown in popularity of late, as the majority of motorists do their own tire repairing; moreover, in the tool box of many cars will be found the little paper screw top can containing a blow-out patch, rubber cement and cold patches for emergency purposes.

Large quantities of these screw top paper cans and tubes are used by manufacturers of repair materials to contain cementless patches, frictioned and coated fabric, unvulcanized tread and tube stock, combination tube stock for inside use and vulcanized pure gum patching sheet for general purposes. Talc for dusting the inner surfaces of casings before inserting the tube, is usually



sold in these containers. They are made in many different sizes to hold combinations of standard supplies and containers for specially equipped tire repair kits are made to order. [The St. Louis Paper Can & Tube Co., St. Louis, Missouri.]

NO MOTOR ROADS IN AMERICA!

Explaining the enormous United States consumption of rubber, "Le Grand Livre Commercial et Industriel," November 5, 1916, says:

The enormous consumption of rubber in the United States amounts almost to two-thirds of the world's production. This is due to the great consumption of pneumatic tires in the United States. There, there are hardly any wagon roads. All is railways and rivers. The roads are bad, and, frequently, are nothing more than trails. The wearing out of tires is, therefore, formidable. But what do the Americans care, if they can cover kilometers. On another hand, the cheap automobile has generalized the use of motor cars, hence, a number of automobiles that we don't know in our old Europe.

New Goods and Specialties.

STAMP PAD WITH MOLDED RUBBER BASE.

TO relieve the stress, and strain of modern business life rubber heels, rubber casters, and many other noise-eliminating and jar-reducing devices in rubber have long ago entered upon enduring popularity. A recent and welcome addition is the stamp pad with molded rubber base—solid, substantial and absolutely noiseless. The base of the one here



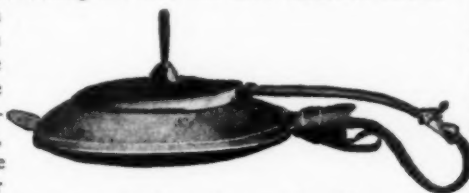
illustrated is of gray rubber, the straight-cut edges extending well beyond the ink pad and thoroughly protecting the furniture upon which it is placed. The cover is of the usual metal variety, painted in yellow with black lettering, and fastened

to the rubber projections at the back of the pad by a small revolving rod.

It is stated that the ink used in this pad is prepared from a new formula which gives non-blurring, quick-drying, perfect impressions. [The Superior Type Co., Chicago, Illinois.]

SWEET'S COLON BATH.

It is generally understood that a large majority of human ills originate in diseases of the colon, or large intestine, and that judicious internal bathing is a safer and more efficacious method of dealing with these troubles than by the use of drugs. The combination internal bath, fountain syringe and hot-water



bottle here illustrated has, besides the usual rubber water bottle and tube, a portable hard rubber pad containing an oil chamber. It is claimed that this is the only internal bath on the market in which oil can be used. [Sweet's Colon Bath Co., Chicago, Illinois.]

ALL-WEATHER TREADS IN SOLES.

Now that rubber soles are used extensively by shoe manufacturers, the anti-skid proposition is being studied and many designs of both soles and heels are now shown with treads intended to prevent slipping as far as possible. The four soles illustrated here are among the latest. The two on the right show adaptations of the vacuum principle, while the upper one



on the left has a series of straight, somewhat diagonal ridges, which answer for this purpose. The lower one on the left is composed of two different compounds neatly joined together, allowing for greater wear where it is most needed. [Avon Sole Co., Avon, Massachusetts.]

THE "CAMP-MOBILE."

Ever since the coming of the automobile, camping accessories have grown in volume and variety, and for some time it has been no uncommon thing for motoring parties to carry with them complete camping outfits, affording a vacation freedom for the conventional house-dweller undreamt of in former years.

The "Camp-Mobile" here illustrated, which can be folded up into a compact closed trailer and attached to the rear of an automobile, contains the latest



improvements in camp comfort, convenience and utility. It will be seen that, unlike many tent arrangements for this purpose, it has a solid canopy deck in the top, made of hardwood frame slats. This is covered with heavy, rubber-coated material, affording a rigid and absolutely weatherproof overhead protection. The side covering is of double-filled khaki and closely woven waterproof duck, with screen ventilators. The wheels are of hickory, painted a dark green, with solid rubber tires. The body of the trailer is 3 feet 8 inches by 6 feet

8 inches, of cabinet-made type, with hardwood sills, wrought iron braces, tongue and groove dust-proof floor. The equipment consists of two double spring beds 47 inches wide and two regular bed mattresses; a collapsible table, two-burner gasoline stove, two-compartment ice box, lockers and shelves, the net weight of the outfit being about 600 pounds.



By removing all camping equipment and attachments, the "Camp-Mobile" may be converted into a commercial trailer, with or without top. Thus its possession may prove a business asset as well as a recreation adjunct. [Cozy Camp & Auto Trailer Co., Indianapolis, Indiana.]

RUBBER-COATED ELASTIC FABRIC.

That elastic fabric cannot be kept indefinitely in stock without deterioration is a well-known fact, for which either the merchant or the buyer frequently has to suffer. This difficulty has been successfully met by a new process in which the usual elastic webbing is coated with rubber, as it were, sealing the fabric, rendering it impervious to the effects of the atmosphere, and consequently prolonging its usefulness. This rubber coating may be applied to all kinds and widths of elastic webbing and is therefore suitable for all the various articles in which webbing is utilized. It can be cleansed readily with a sponge, and it is claimed that if applied to webbing that has already lost its snap through rotting of the threads, this rubber coating will give it a new lease of life. [S. & W. Rubber Manufacturing Co., College Point, New York.]

"ALLINONE" COMBINATION HOT WATER AND ICE BAG.

In nearly every form of illness either hot or cold applications are beneficial, and by the prompt relief thus afforded many lives are saved while awaiting the physician's arrival. The rubber bag shown herewith may be used to contain either ice or hot water and is said to have unusually satisfactory properties for both purposes, holding heat longer for the hot applications, and not perspiring, as do some, when used as an ice-bag. Also, the "Allinone" is claimed to be absolutely airtight, withstanding the most severe tests of continual sterilization, and being unaffected by steam under pressure, acids, benzene, alkali, saline solutions and other chemicals. It is extremely light in weight, yet durable, and so flexible that it will shape itself to any part of the body. [Simon Kaufman Co., Inc., Philadelphia, Pennsylvania.]

**NORTH BRITISH PRODUCTS.**

At first thought it would seem that rubber erasers offer slight opportunity for variety, but by the use of trade names, designs, and different colors and shapes, a diversity is obtained which



affords a large scope for sales. Many of these erasers are used by school children, to whom the rubber with a picture, or a name, or a pretty color especially appeals, but they are excellent for general use and there is a surprising number of adults who purchase more readily an article of any character with a distinctive mark of some sort.

The British flag and the words "British Empire" form the patriotic scheme of decoration for a pencil eraser in white rubber, shown herewith, which is designed for ordinary school and office use. The "Chick" brand has a velvety softness of texture and is especially adapted for cleaning large surfaces and for working on paper of delicate texture. The imprint also appeals to the juvenile purchaser, and this eraser is supplied in red, white and green. The well-known "Thistle" trade-mark of the manufacturer adorns the third eraser shown

in the illustration, which comes in an artistic shade of pale gray.

Then there are the "Peter Pan" erasers, in exceptionally attractive shades of brown and blue; the "Perfection," "Unity,"

"Atlas"; the "Draughtsman," a specially soft rubber for drawing office use; the "Racer," showing a horse's head; and the "Palette," with a design of an artist's palette and brushes, furnished in red and white, and particularly suitable for artists' use.

A popular raincoat made by the same company is also shown. This coat is built on severely simple lines that give a well-tailored effect. [The North British Rubber Co., Limited, Edinburgh, Scotland.]

WIND-SHIELD CURTAIN FOR FORD CARS.

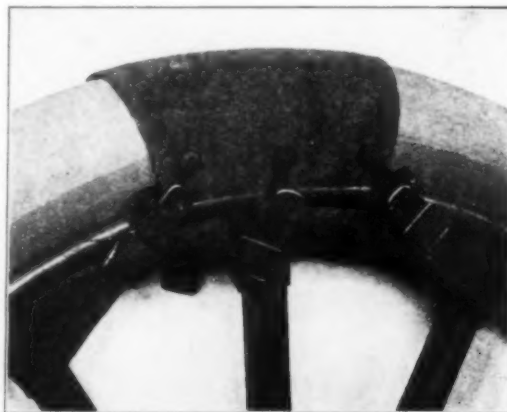
A simple accessory which adds considerably to the comfort of automobile driving is shown in this combined wind-shield and top curtain for Ford cars. It is made of heavy, rubber-coated auto-cloth and consists of a curtain which closes the space between the wind-shield proper and the top of the car, affording complete protection from wind and storms. This curtain is arranged to fasten along the front edge of the top and is very easy to attach. [Nathan Novelty Manufacturing Co., New York City.]

**"KLINGERIT" TYPE COMPRESSED ASBESTOS SHEET PACKING.**

After the European war was declared, the great American demand for this product, manufactured exclusively in Germany, Austria and England, could no longer be met. Imports ceased and the supply in this country was soon exhausted. Appreciating the opportunity thus afforded, a Connecticut firm manufacturing similar goods began to experiment along this line and is now producing at the rate of 1,000,000 pounds yearly, a compressed asbestos sheet packing that meets every service requirement and stands up under the most rigid tests. [Royal Equipment Co., Bridgeport, Connecticut.]

"BUCKLE-ON" BLOW-OUT PATCH.

For remedying tire blow-outs, there are patches and patches. Many combine the virtue of durability with the objectionable feature of a thickness which causes an unpleasant bump at every revolution of the tire. It is claimed that in the blow-out patch here illustrated, exceptionally strong, tightly-woven fabric and tough tread rubber take the place of inconvenient thickness and



maintain the smooth riding qualities of the unpatched tire. Also, it cannot creep and expose the hole intended to be covered because the buckle straps which fasten it on are wrapped around the spokes of the wheel and hold the patch firmly. This handy accessory is supplied in 3-3½, 4-4½ and 5-5½-inch sizes, so that one patch fits two sizes of tires. [The Goodyear Tire & Rubber Co., Akron, Ohio.]



BRITISH MOTORCYCLE BELTS.

RUBBER V-shaped motorcycle belts, now almost entirely unknown in America, are very popular in Europe, especially in Great Britain, where they are used, almost to the exclusion of all other mediums of power transmission, on two-wheeled motor vehicles. The reason advanced by those conversant with the subject is that American motorcycle manufacturers do not

appreciate the real advantages of this flexible and efficient drive.

Early American motorcycles were provided with belts of both the flat and V-shaped types. When flat belts were used, it was almost impossible, owing to limited space, to fit belts of sufficient width for transmitting the power from the engine to the rear wheel without considerable slipping, which caused the belt to wear out rapidly.



THE NORTH BRITISH CLINCHER FLEXIS BELT.

Trapezoidal, or V-shaped belts, were but little more successful because, in all cases, either the driving pulley or the belt used was too small for the horse power to be transmitted. Both flat and V-shaped belts gave way to chain drive before their use was sufficiently well understood to demonstrate their value for motorcycle power transmission, and the feeling is still strong among many American motorcycle men that they are not practical for our heavy, high-powered machines.

In Europe, correct designing has perpetuated rubber motorcycle belts, which are claimed to be more flexible, easier on the machine, tires and rider, and just as efficient under usual conditions as chain transmission.

Here are some well-designed types of belts made in Great Britain of rubber and canvas and embodying important features. In these every factor in running conditions appears to have been studied closely by practical motorcyclists as well as engineers. The grooves absorb the natural displacement of rubber when the

belt is bent to negotiate the small driving pulley. Without these grooves the belt, when so bent, would widen at its base so that the top half would be forced away from perfect contact with the pulley.

The fabric of motorcycle belts must be of the best quality of cotton, proofed with rubber and embedded in a tough and wear-resisting rubber compound. Belts must be designed and constructed to insure a minimum of stretch.



THE AVON WATERSHED BELT.

It is claimed that the belts here shown, when properly adjusted and proportioned to the power to be transmitted, will keep their adjustment, will not slip in wet weather and will give

efficient service for more than 10,000 miles on rough roads.

High-power motorcycles are still much in favor here in America, but, thanks to improvements in clutches and gear-sets, economical, light, low-power machines are rapidly being appreciated. Hence more study and investigation should be given to the qualities of rubber transmission belts for the latter type of motorcycles.

CLOSET-SEAT BUMPERS.

Rubber bumpers to be fastened to the under surface of water-closet seats have been used in various forms and designs for many years. The style shown here is one of several patterns made with nickeled escutcheon plates. In 1908 The Elastic Tip Co., Boston, Massachusetts, prepared molds to make a tip similar to this in style, but to be held in place by two screws, at the extreme ends, put through countersunk holes in the rubber. In May, 1909, Charles Pfau, of Cincinnati, Ohio, applied for a patent for a bumper substantially like this. The application was rejected several times, but one with some modifications was al-



lowed in February, 1915. As The Elastic Tip Co.'s molds were made the same month as the original application, namely, May, 1909, they could not antedate that application sufficiently to invalidate the patent.

Immediately upon the issuing of the patent Mr. Pfau organized the Long Seat Bumper Co., a holding company, which made arrangements with the Mechanical Rubber Co., of Cleveland, Ohio, to manufacture these bumpers and place them on the market. Notices were sent to the trade announcing the patent, together with warnings that suits would be brought if rubber manufacturers continued to make and sell such bumpers. It is said that in one or two instances suit has been invited.

Because there appeared to be only a comparatively small sale for such a bumper as that patented by Mr. Pfau, The Elastic Tip Co. decided to put out a line of various shapes, with metal escutcheons, this method of fastening differing from that employed in the Pfau patent. These are made with various lengths of bumpers, some having flat faces, like the one illustrated, while others have convex or semi-cylindrical faces, and on these there is a moderate, steady demand from hardware and plumbers' supply dealers.

GEO. S. COLTON ELASTIC WEB CO.

The Geo. S. Colton Elastic Web Co., Easthampton, Massachusetts, has increased its capital stock from \$250,000 to \$350,000 by the addition of \$100,000 preferred stock, \$50,000 of which has been sold to increase the working capital, the balance to be held for sale as the business may require.

George S. Colton is no longer connected with the company, his entire stock holdings having been purchased by C. A. Richmond, who has resigned as treasurer of the Glendale Elastic Fabrics Co. to assume active management of the Colton company. In order to correct current rumors, it is announced that neither this company nor Mr. Richmond has any connection with any other company in a similar line.

RUBBER MAN INSURED FOR \$1,800,000.

Harry Thatcher Dunn, Toledo, Ohio, president of The Fisk Rubber Co., and vice-president of the Willys-Overland Co., is now counted among the largest life insurance policy holders, his total of \$1,800,000 being exceeded by only three or four other American business men. To take up this amount, several insur-

The Editor's Book Table.

PLANTATION RUBBER SECTION, TRADE SUPPLEMENT, "THE Times," London, England, December, 1916. [30 pages with maps of the rubber growing areas.]

WITH England controlling the growth and supply of plantation rubber, which now far exceeds the production of all other varieties, American manufacturers of rubber goods must look toward London for authentic information regarding this great British industry, and "The Times" has supplied a comprehensive summary, consisting of many signed articles by world-famous experts, covering virtually the whole field of rubber supply, manufacture and finance. That a copy for reference will prove invaluable to every consumer of crude rubber may be seen upon examination of the principal features of the table of contents reprinted below.

Rubber and War. Sir Frank Swettenham, K.C.M.G.
History of Plantation Rubber. Gilbert R. Redgrave.
The World's Rubber Position. W. H. Rickinson
Experimental Cultivation. Samuel Rideal, D.Sc., F.C.S.
Diseases and Pests. J. Mitchell, A.R.C., Sc.
Scientific Assistance. J. Bretland Farmer, F.R.S.
Some Present Needs. Wyndham Dunston, C.M.G., F.R.S.
Influence of Exhibitions. Sir Henry Blake, G.C.M.G.
Rubber, a National Asset. E. Stevenson.
The Rubber Growers' Association. C. Emerson.

Many other signed articles review planting in British dominions and abroad; getting rubber to market; rubber and finance; and rubber in industry, including vulcanization, testing, factory control, footwear, rubber heels, tires and synthetic rubber.

As to future supply, the constantly increasing demand of the American tire industry is recognized as a vital matter to be reckoned with. For six years past the annual consumption of the United States has averaged to increase 25 per cent, until it now totals more than half the world's entire production. Should this continue for five years, W. H. Rickinson expresses the belief that within that time the supply of crude rubber would become insufficient to meet the demand; that as far as can be judged at the present time, as 1907 was to 1910, so in all probability the position in 1918 will be to that of 1921.

ELEMENTS OF INDUSTRIAL CHEMISTRY. By Allen Rogers, D. Van Nostrand Co., New York City. [8vo, illustrated, 513 pages, cloth. Price \$3.]

This is an abridgment covering the salient points of the author's more comprehensive "Manual of Industrial Chemistry," the subjects being treated in a general manner only. As much detail as possible has been eliminated that the fundamental principles might be more clearly set forth. While the range of subject is not as broad as that of the larger volume, it is still sufficient to give the student a very comprehensive view of the entire field, and so fills a definite need. Rubber men will be particularly interested in the chapter on resins, oleo-resins and gum-resins, including india rubber. Of the other 26 chapters, those of particular value to the rubber trade include: Coal Tar and its Distillation Products, The Petroleum Industry, Essential Oils, Textiles, Water and its Purification, and Pigments, some of which are used as rubber compounding ingredients.

TROPICAL AGRICULTURE. BY EARLEY VERNON WILCOX, OF the United States Department of Agriculture. D. Appleton & Co., New York City. [8vo, 373 pages, illustrated. Price, cloth, \$2.50.]

Written primarily for the business man and agricultural student, this book tells what everybody ought to know about the tropics. It deals with agriculture in the commercial sense, and describes the nature, source and production of about 350 tropical commodities to eat, wear, and use in technical industries. Particular attention is given to the presentation of an intimate picture of animal industry, soils, climate and economic conditions.

A concise but comprehensive chapter has been devoted to rubber, in which gutta percha, balata, jelutong, chicle, camphor and other gums and resins are dealt with. The young man who contemplates locating in South or Central America will find particular interest in those chapters devoted to the tropical climate and its effects on man, farm animals and crops; the importance of tropical products and commerce; economic and social conditions and opportunities in the tropics; agricultural methods peculiar to the tropics and tropical soils.

COTTON FACTS. BY CARL GELLER. SHEPPERSON PUBLISHING CO., New York City. [16 mo., 240 pages, cloth. Price \$1.]

This statistical review has justly become the cotton man's ready reference work of the English-speaking world. In the present forty-first annual edition the material gathered for so many years by the late Alfred B. Shepperson has been brought up to date by Carl Geller and represents a remarkably comprehensive compilation of official and reliable data. Whether the information required relate to crops, receipts, exports, stocks, home and foreign consumption, visible supply, prices, acreage, or mills, in the United States or abroad, the index will disclose it quickly. Special features of this edition include the details of production of long-staple cotton in the United States; statistics of cotton in Great Britain since 1801; cotton yield in the United States by states and per acre from 1900 to 1915; and a table of important fluctuations of the January and July options on the New York Cotton Exchange from 1911 to 1916.

ADVERTISING BY MOTION PICTURES. BY ERNEST A. DENSCH. The Standard Publishing Co., Cincinnati, Ohio. [8vo, 255 pages, cloth. Price \$1.50.]

With the entire country under the spell of the motion picture it is not surprising that advertising agents have appreciated its mighty powers in direct as well as indirect publicity. The mission of the present book, therefore, is to set forth the possibilities of this latest medium for entering foreign and developing home markets; for introducing new and increasing the demand for older goods; for familiarizing the public with trade names, production sources and methods, and even facilitating direct salesmanship. Notable instances of the application of motion pictures in several lines of business are recounted, and many suggestions given for the preparation and display of films, together with other details making for the success of such a venture.

SPANISH-AMERICAN DIRECTORY AND BUYERS' GUIDE IN THE United States. Export Trade Directory Co., Inc., New York City. [Quarto, 570 pages. Price, paper covers, \$4; cloth covers, \$5.]

A very extended list of all manufacturers and dealers in the United States who are interested in foreign trade is provided by this large and important work intended for the use of business men in Spanish-American and Portuguese-American countries. The directory portion proper is very extensive, each heading being given in Spanish, Portuguese, French and English, while in the front of the book are indices in each of the four languages referring to the pages on which are to be found lists in the various trades. A portion of the book is divided into four sections, each section being of a different color paper and having an index in the corresponding language. Upon looking up an article in any one of the above-mentioned languages, its equivalent name is found in the other three. The book contains a vocabulary in these four languages of phrases necessary to the traveler, together with many technical terms frequently used in business correspondence. Tariffs for telegrams, money exchange and other data are tabulated. The various Latin-American countries are described from a commercial standpoint with hand-

some illustrations, and a great amount of information regarding the United States and especially New York City is included.

ANNUAL REPORT OF THE SECRETARY OF THE NAVY FOR THE fiscal year 1916. Published by the Government Printing Office, Washington, D. C. [Paper, 8vo, 143 pages.]

The navy, our first line of defense, is of interest to every business man, and according to this report the fiscal year ending June 30, 1916, has marked the largest expansion in times of peace, while the three-year building program covering a total of 813,000 tons, stands out beyond all precedent in the history of the United States. The year has seen marked advances in efficiency in many directions, but business men will find particular interest in the industrial activities of the shore stations and navy yards, and the growing tendency of the government to reclaim its own waste material and to manufacture many of its essential supplies as a matter of economy. The Navy Department is also going a step farther and interesting itself in conservation of natural resources, such as petroleum in naval reserve lands, and the encouragement of growing staples, such as cotton in Guam.

Rubberized fabric manufacturers will look with favor upon the increased attention being given to aircraft for sea service and the recommendation of the General Board that \$6,000,000 be appropriated in the 1918 program for naval aeronautics.

Full recognition of the importance of chemistry and every branch of engineering in national defense is seen in the activities of the Naval Consulting Board, which is cataloging our industrial resources, among which rubber manufacture ranks high, and bringing the minds of our greatest scientists to the solution of many big problems for the common good. These investigations promise to develop advances no less monumental than those in wireless telephony.

ANNUAL REPORT OF THE PAYMASTER GENERAL OF THE NAVY for the fiscal year 1916. Published by the Government Printing Office, Washington, D. C. [Paper, 8vo, 318 pages.]

Supplementing the report of the Secretary of the Navy, this shows that improved business methods, particularly in the purchase of supplies, have increased the purchasing power of every dollar to the maximum and effected a concrete saving of \$2,149,933, the total expenditures for the year being \$152,821,540.67. Manufacturers of rubber goods will be interested in the statement that of the \$207,672,299.82 property investment of the stores of the navy, \$473,288.07 is listed as insulated cable and wire, and \$326,854.54 as rubber packing, gaskets, etc.

CANADIAN TRADE INDEX. CANADIAN MANUFACTURERS' ASSOCIATION, Inc., Toronto, Canada. [Large octavo, 560 pages, cloth. Price, \$5.]

This book seems to supply a very full and comprehensive directory of the manufactures of Canada. The alphabetical list of articles occupies about 350 pages. This is followed by about 50 pages, giving an index, arranged alphabetically in French, of the headings in the main portion of the directory, thus rendering it valuable to that large class of people in Canada who use French preferably to the English language. There is also a complete alphabetical list of Canadian manufacturers, giving not only the main offices but the addresses of their factories. These two latter lists are printed on blue paper, one at the back and the other at the front of the book, thus enabling the user to turn at once to the desired section. A considerable amount of valuable mercantile information regarding the Dominion is also given.

STATISTICS OF MANUFACTURES, COMMONWEALTH OF MASSACHUSETTS. Twenty-ninth Annual Report, Bureau of Statistics, Boston, Massachusetts. [Paper, 8vo, 114 pages.]

According to this latest official source of information, the manufacture of boots and shoes continues to lead that of cotton goods as the greatest industry of Massachusetts, greatly exceeding in value the similar product of any other State and almost equaling the sum of New York, Missouri, New Hampshire, Ohio and

Pennsylvania, the other principal shoe producing States. The total value of the product of all industries in Massachusetts is given as \$1,641,373,047, of which \$255,188,013 represent boots and shoes, cut stock and findings. To this may be added rubber footwear to the value of \$23,788,788 manufactured by 8,087 wage earners in nine factories representing an investment of \$23,027,061. Woven belting and hose to the value of \$942,180, were produced by 183 operatives in six plants having an invested capital of \$906,033. Miscellaneous rubber goods amounted to \$23,011,349 and were the product of 4,743 wage-earners in 42 factories representing an investment of \$17,345,185. This includes automobile tires, which, unfortunately, are not given separately, although the total industry of the State is large.

NEW TRADE PUBLICATIONS.

Any of the following publications will be supplied by those issuing them, upon request.

The Osborn Manufacturing Co., Cleveland, Ohio, sends out a handsome, self-binding catalog so arranged that it can be kept up to date by mailing fresh pages to replace others in case of changes in styles or prices. The catalog numbers more than 300 pages, and contains well-arranged lists, voluminously illustrated, of the various lines of manufacture, including brushes and brooms, hardware specialties, foundry supplies, etc.

Among the various articles which are largely used by tire and rubber manufacturers, are hand wire scratch brushes, which are employed to take the place of sand paper, steel wool and other abrasives, and which, it is claimed, enable the user to do quicker and better work. These are made in various shapes and styles for many purposes. There is also a large line of rotary wire buffing brushes, as well as other lines of brushes and dusters especially suited for rubber mills, among which the company has a large trade.

* * *

"A Chain of Evidence" is the appropriate title of a handsome 20-page pamphlet issued by the Morse Chain Co., Ithaca, New York, to show the construction and many uses of the Morse silent chain for small power drives. Many large half-tones illustrate its application to pumps, mixers, rolling mills, ventilating fans, textile spinning frames and many other machines.

* * *

Two large and handsome wholesale catalogs for the 1917 season have just been issued by the Dunlop Rubber Co., Limited, Aston Cross, Birmingham, England. One is devoted to motor tires, wheels, rims and sundries, and features the Dunlop Plain, Grooved, Steel-studded, Rubber-studded, Combination Rubber and Steel-studded Tires, together with the Dunlop Detachable Wire Wheel, Twin Wire Wheel, and Steel Wheel. The other catalog contains only bicycle and motorcycle tires, rims and sundries. The bicycle line is exceptionally varied, and includes the Dunlop Magnum Roadster, Juvenile, Road Racing, Carrier, Tubular Sprint and Path Racing Tires; Warwick Roadster, Juvenile Speed Carrier, and Heavy Carrier Tires; the Cambridge Roadster and Juvenile, the Edinburgh Roadster, and Pericles. Each tire has an inner tube of corresponding brand. For motorcycles there are the Ribbed, also the Rubber-studded Motorcyclette tires, the Rubber-studded, Three-ribbed, Combination and Side Car Motorcycle tires, all with beaded edge; and the Ribbed Racing and Rubber-studded, both wired on. Butt-ended tubes are recommended for these. An accompanying circular describes the Dunlop golf balls.

* * *

Editorially, and in an article on electric drive and safety controls in rubber mills, elsewhere in this issue, the increasing importance of electricity and electrical devices in the manufacture of rubber goods has been emphasized. Thus the 1916 Electrical Supply Year Book, published by the Western Electric Co., Incorporated, New York City, will be of value to every factory

superintendent and electrician. Including as it does the seemingly infinite number and variety of devices and equipment manufactured by this great and rapidly growing firm, this 1,500-page large octavo volume, bound in boards, is at once a descriptive catalog and a price-list. Rubber parts are conspicuous in the construction of much electrical equipment and, as shown by the index, electricians find frequent use for such rubber goods as boots, casings, gloves, matting, rings, rods, sheets, tubing, vulcanizing rubber and cements.

* * *

The Lenz Apparatus Co., New York City, formerly Lenz & Naumann, Inc., has issued a large, well-illustrated, cloth-bound catalog of general laboratory apparatus and supplies that merits a place in the reference library of every industrial chemist. Its 499 pages include virtually everything in laboratory equipment and the work is prefaced by 15 pages of general chemical information, chiefly tabular matter. Over 6,000 articles are listed, most of them being illustrated and bearing serial numbers for ready reference to the description and price.

* * *

A special catalog and price list of hose has been issued by the Peerless Rubber Manufacturing Co., New York City, manufacturer of mechanical rubber goods for all purposes. Profusely illustrated, artistically arranged and well printed, its 48 pages emphasize the highly specialized business hose manufacture has become, with many sizes, weights and types of construction for varied needs. Several fabric and wire as well as rubber coverings are shown as well as metal-lined suction hose. The line also includes couplings, nozzles and rubber tubing.

HOLIDAY GREETINGS.

THE arrival of many attractive and useful articles of infinite variety from friends desirous to express kindly remembrance renews the spirit of the holiday season and reminds us agreeably of the arrival of the year 1917. For these holiday greetings which are enumerated below we express our sincere thanks, and take this opportunity to wish the rubber trade collectively and individually a prosperous New Year. And may this coming twelvemonth see the establishment of a lasting concord among the nations which will permanently insure the brotherhood of man.

SOUVENIRS AND NOVELTIES.

George F. Lufbury, Jr., manufacturer of chemicals, Elizabeth, New Jersey, has sent another of his unique calendars so valuable for reference in every office. Each sheet carries three months, the current month being centrally located in bold face type, and the previous and coming month being respectively above and below in outline type.

John Royle & Sons, Paterson, New Jersey, are distributing their ever-welcome leather-bound, vest-pocket diary with the usual tabular matter and memorandum pages in addition to the daily spaces. Motorists will welcome the tire mileage record page, and with foreign affairs uppermost in every mind it was a happy thought to insert the many colored maps of the world.

CARDS AND CALENDARS.

J. W. Coulston & Co., importers and manufacturers of dry paints and colors, New York City.

J. H. Day Co., rubber mixers, Cincinnati, Ohio.

Edward B. Fulper, importer and manufacturer of minerals, acids and chemicals, Trenton, New Jersey.

Holmes Bros., rubber molds and special machinery, Chicago, Illinois.

L. J. Muttly Co., rubber cloths and tubing, Boston, Massachusetts.

New Jersey Rubber Co., dealer in all kinds of reclaimed rubber, Lambertville, New Jersey.

J. H. Stedman Co., scrap rubber merchants, South Braintree, Massachusetts.

E. M. & F. Waldo, colors for rubber compounding, New York City.

Charles E. Wood, broker in crude rubber, balata, gutta percha and kindred products, New York City.

Davol Rubber Co., manufacturer of druggists', surgeons', dentists' and stationers' sundries, Providence, Rhode Island.

Monatiquot Rubber Works Co., reclaimer of waste rubber, South Braintree, Massachusetts.

RUBBER FOOTWEAR PRICES.

AS has been the custom for many years (with a single exception), the manufacturers of rubber footwear will announce their prices, terms and discounts for the coming year on January 1. The plan usually is to time the mailing of the information so it will reach the wholesalers simultaneously in every part of the country. The manufacturers are unwilling to give out any information regarding this matter in advance, and THE INDIA RUBBER WORLD is unable, therefore, to print any official news on this subject in this issue.

There is no doubt, however, that prices will be materially advanced. Those in effect up to December 31, 1916, were practically the same as those made March 1, 1915, though the price lists of January 1, 1916, showed advances of five cents or less.

The rubber boot and shoe situation at the present time is peculiar. This business is dependent almost entirely on climatic conditions. If the winter be mild, retail and wholesale dealers will generally carry over sizable stocks to the following season. Should there be considerable snowfall, naturally the stocks will be sold out. When there are several early snow storms, the chances are for a much heavier consumption of footwear during the season, for people who start wearing rubbers early, are likely to need a second pair before the winter is over.

Last winter was a mild one, and in February or March, stocks of rubbers were large, but late severe storms so affected the trade that stocks were depleted, and almost no rubbers were carried over. This resulted in the placing of heavier advance orders than usual, and many of the manufacturers found their factory capacity sold very early in the summer. The demand for help in the munition factories resulted in a drain on the working forces in the rubber factories, and secondarily in labor troubles. The consequence has been that the manufacturers, foreseeing that all orders could not be filled, adopted the plan of distributing their output proportionately. In this way most of the wholesalers have received 80 or 90 per cent. of their orders. By the terms of their contracts with some of the manufacturing companies, the unfilled portions of their orders are automatically cancelled at the conclusion of the contract period, namely December 31, unless specifically renewed at the new prices.

Regarding the 1917 price lists, there is this much to be said. Brazilian rubber prices are about 15 per cent higher than they were when the 1916 prices were made, while plantations are practically the same. But everything else entering into the manufacture has advanced, some as much as 100 or 200 per cent. Chemicals and compounding ingredients show such advances. Cotton fabrics are 50 to 60 per cent. higher, and labor costs 10 to 20 per cent. more. Taking these into consideration, the manufacturers would seem justified in making a material advance in their prices, and they will undoubtedly do so.

ICE BAGS RULED MANUFACTURES OF COTTON.

Judge Cooper, New York City, has sustained the Board of Appraisers in classifying ice bags of cotton and rubber, imported by Knauth, Nachod & Kuhne, as manufactures of cotton assessable at 30 per cent, the importers having claimed 15 per cent duty as manufactures of india rubber or gutta percha commonly known as druggists' sundries.

Interesting Letters from Our Readers.

BELGIAN EXPERT DEVISES CASTILLOA KNIFE.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—I write to call your attention to a colossal on page 45 some interesting particulars about rubber growing in Mexico. The letter signed "Planter" does not surprise me. Perhaps you will remember I have always maintained that the two rubber trees most difficult to handle are the *Castilloa* and *Funtumia*. Still, when worked judiciously, good results can be obtained. Perhaps you may recall that four to five years before the war I made some technical reports about *Castilloa* for two of the most important American companies growing rubber in Mexico. I have made a special study of the knife required for *Castilloa*, also the method of tapping and coagulating the latex. If I could be in Brussels I would send you samples of Mexican *Castilloa* coagulated by myself which compare favorably with the best plantation Para in Middle East.

Kindly send my card to "Planter" and advise him that I am prepared to make a full technical report dealing with the following items:

1. How and when to commence tapping.
2. My design for a suitable knife.
3. Spout and cups to be used.
4. How to coagulate and prevent sweating of *Castilloa* rubber.
5. The best shape for the rubber.
6. Methods of packing.

G. VAN DEN KERCKHOVE,

26 Stanhope Road, Highgate, London N., England, November 11, 1916.

THE BIGGEST OF ALL HEVEAS.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—I write to call your attention to a colossal *Hevea*, probably the largest in the world. It is 127 feet in circumference at the base, and has a record of yielding for 120 days an average of 22 pounds of rubber a day. As you have of late been publishing notes on the world's largest rubber trees, I am pleased to be able to supply the actual facts regarding this tree.

It is situated at the Seringal Porvir on the River Acre in Brazilian territory at a considerable distance from the Bolivian frontier. This seringal is now the property of a friend of mine, Colonel Antonio Vieira de Souza. The tree is exploited by a whole family, father, mother, and several children, and its yield is about as stated. This family divides its time between cultivating the cereals necessary for food and the extraction of the rubber latex. This is not the only giant *Hevea* tree in that region. There are thousands of them, but this is the largest under exploitation. Just at this point the country is considerably higher than the whole surrounding lands, which leads to the conclusion that it was from the seed of these denizens of the forest that the *Hevea* found its way both east and south of Brazil, for native *Hevea* is found as far south as the seventeenth degree, and as far east as the south of Maranhão.

This tree must have been growing long before Columbus discovered America. No such thing as a rubber plantation exists in the upper Amazon, and the trees which have been planted here and there in the whole north of Brazil cannot properly be called plantations. The only practical attempt in this direction was made by me in lecturing on the subject at the Engineers' Club in Rio de Janeiro in 1912, by virtue of which the Brazilian Government promulgated laws offering prizes for the planting of rubber and establishing experimental stations throughout the

rubber region, especially at Piahy, Maranhão, Bahia and Pará; but just when this was about to be put into practice, financial difficulties arose, and since then the war has made impossible any attempt in that direction.

J. SIMAO DA COSTA.

Pará, December, 1916.

COTTON CROPS THREATENED.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—I am spending the month of December studying the cotton situation in the southern States and I have noticed a point which I believe will interest you and the readers of THE INDIA RUBBER WORLD. The boll weevil which entered Texas at Brownsville in 1892 has advanced at the rate of about 65 miles per year and has now covered half of Florida. The Sea Island cotton is threatened today and entomologists believe that it will affect this cotton even worse than it affected the uplands or short staple cottons.

The estimated loss caused thus far by the boll weevil is one billion dollars. In Florida alone in 1915 the loss was approximately one million dollars. Sea Island cotton matures late and will therefore suffer markedly from the attack of the boll weevil. The supply of Sea Island will be cut short. It is small enough under ordinary conditions. On November 20 it sold in New Bedford, Massachusetts, at 52 cents per pound; if the yield per acre is cut down to one-third of the present, the price will become prohibitive.

Tire duck manufacturers will have to abandon Sea Island cotton. They will have to fall back on ordinary staple cottons and the strength of the fabric will have to be secured in some other way. Either the structure of the yarns and fabric must be changed, or the fabric must be given a chemical treatment to increase its strength.

This whole subject is of such far reaching importance that it cannot be given too much serious attention. It is, in my mind, worthy of immediate consideration by the tire manufacturers.

FREDERIC DANNERTH.

Atlanta, Georgia, December 6, 1916.

WATCHING THE ENEMY.

THAT our esteemed contemporary, "Le Caoutchouc & la Gutta-Percha," scans every line of THE INDIA RUBBER WORLD, and with the keenest sort of analysis, may be gathered from the following:

"Patent Literature" is always very interesting to read and in it one often meets interesting things.

Thus, going through the September issue of THE INDIA RUBBER WORLD, we see that Messrs. Max Theumann and Joseph Koestchet have sold to the Société Chimique des Usines du Rhône their American patent, No. 1,191,439, referring to the preparation of ethers of cellulose.

Would it be an indiscretion to inquire into the nationality of Messrs. Max Theumann and Joseph Koestchet, whose names sound strongly German?

We further see in this same "literature" that the Société Générale des Caoutchoucs de Térébenthine (General Turpentine Rubber Co.) has taken out a Canadian patent, No. 168,727, the object of which is to reclaim old rubber by means of tetrachlorethane. The process is, no doubt, the same as that patented last year by Count Charles de Villers.

COPY OF INDEX TO "Rubber Machinery" will be sent free upon request.

The Obituary Record.

A VETERAN RUBBER IMPORTER.

HENRY A. GOULD, head of the Gould Commercial Co., Inc., 12 Bridge street, New York City, dealer in crude rubber and tires, and without doubt the dean of American crude rubber men, died December 25 in the Overlook Hospital, aged 73. He was a resident of Chatham, New Jersey.

Mr. Gould was born and lived many years in Boston, Massachusetts, attending the public schools there and receiving his mercantile education in the offices of P. & J. P. Hawes & Co., an East India house with which he remained for four years. At the age of 21 he became a partner in the East India brokerage firm of Robert Williams & Sons, Boston, established in 1834 and the leading brokers in East India products, especially rubber and gutta percha, having prominent connections in New York. Five years later he retired from the firm and spent a year traveling in the West, where he represented large financial interests in Duluth and Minnesota prior to the panic of 1873.

Deciding to remain in the Eastern financial centers, Mr. Gould opened an office in Boston on his own account for dealing in rubber, with Earle Brothers as a New York connection. Later the Gould Commercial Co. was organized in New York to import aniline dyestuffs and refine crude camphor, three of the five American camphor refineries being acquired by the company.

In 1897 the Boston business, conducted under the name of Henry A. Gould, and the New York business of the Gould Commercial Co. were consolidated as the Henry A. Gould Co., with headquarters in New York and a branch in Boston. It was decided to concentrate upon crude rubber, and branches were therefore opened in Trenton, New Jersey, Para and Manaus, Brazil, and later in London, England. Representatives were located in Mexico, Central and South America, and Africa, as a result of which many new grades were introduced to American trade, notably Pontianak.

The Henry A. Gould Co. was incorporated in New Jersey in 1902, and again in New York in 1905. The Gould Commercial Co., Inc., to which he was devoting himself at the time of his death, was a Delaware company incorporated in 1914. During Mr. Gould's varied career in many branches of the rubber industry, including import, export and manufacture, many young men have learned the business under the guidance of his broad experience, no less than ten of them having since become leading rubber merchants.

In 1902 Mr. Gould married Miss Edna F. Ellis, of Philadelphia, Pennsylvania, and it is said to have been largely through her influence that he had previously become treasurer and active superintendent of the New York Rescue Band, which maintained clubrooms, employment bureau, etc., on Fourteenth street, New York City.

A RUBBER COMPANY FOUNDER.

In the recent death of Henry Binns, Passaic, New Jersey, has lost the father of many important business enterprises and an inventor of note. Mr. Binns was an iron molder by trade, and although born in England and the inventor of a device for planing armor plate used in the British navy, also invented the first steam hammer used by the Krupps of Germany in building their 100-ton guns. In 1869 he came to America and was one of the founders of the Manhattan Rubber Co., Passaic, New Jersey, the Hobart Trust Co., the New Jersey Engineering & Supply Co. and the Guarantee Mortgage & Title Insurance Co.

Mr. Binns is survived by his wife, six children and nineteen grandchildren.

A NEW ENGLAND RUBBER CLUB PRESIDENT.

John Henry Flint, president of the Tyer Rubber Co., Andover, Massachusetts, died at his home in that town November 29, in the seventy-fifth year of his age. Mr. Flint was born in Andover, and after a public school education entered the market business, at the same time developing his real estate interests.



J. H. FLINT.

He early became interested in the Tyer Rubber Co., and was made a director in the company in 1876. From 1882 to 1913 he occupied the position of treasurer, and in the latter year was elected president of the company, which office he held up to the time of his death. He was a director of the Rubber Manufacturers' Mutual Insurance Co., and served for two years as president of the New England Rubber Club.

Besides his interest in the rubber business, he was intimately connected with business and town affairs in Andover. For 34 years he was connected with the Andover Savings Bank, a part of that time as president, and was also a director in the Andover National Bank and a director in the Merrimack Mutual Fire Insurance Co. He served the town of Andover as selectman, assessor, town clerk, treasurer, chairman of the Water Commission, chairman of the Board of Public Works, and chief of the Fire Department. He was a member of Masonic and Odd Fellows Organizations, and of the Andover Club. In 1873 he married Miss Frances A. Tyer, who survives him, as do also two married daughters.

Mr. Flint was noted for his keen judgment in business matters. He was straightforward, shrewd, possessed of a kindly humor, and deserved and possessed a host of friends.

PIONEER RECLAIMER.

George Agnew, founder of the Raymond Rubber Co., Titusville, New Jersey, died early last month at Mercer Hospital, Trenton, New Jersey, aged 80 years. The Raymond company, which formerly operated under several other names, is a rubber reclaiming concern. After a long and successful career in the reclaiming business, Mr. Agnew retired from active work about eight or ten years ago, and three of his sons, Raymond H., Robert P. and John B. Agnew, now carry on the business.

MANY YEARS MANAGER OF A RUBBER COMPANY.

In the death of Frank DeWitt Hotchkiss, December 23, after long suffering with liver trouble, Fairfield, Connecticut, loses one of its most prominent citizens. For 28 years he had been manager of the Fairfield Rubber Co., now the Du Pont Fabrikoid Co. Indeed he had been identified with the rubber industry

from boyhood. Mr. Hotchkiss began his career in association with his father, who was one of the founders of the Goodyear Rubber Co., at Naugatuck, Connecticut, and upon his father's death became connected with the American Rubber Co., Boston, Massachusetts, whence he went to Fairfield permanently.

Held in high esteem by all, and regarded as one of the leading citizens of Fairfield, he never aspired to public office. He was a member of the Automobile Club of Bridgeport, the Wednesday Afternoon Musical Club, Trinity church vestry, Southport, Connecticut, and a charter member of Sentinel Lodge, I. O. O. F., of Naugatuck.

Mr. Hotchkiss was 65 years of age and is survived by his wife, three daughters and two sons.

DIRECTOR IN A RUBBER COMPANY.

Josiah Quincy Bennett, who died at his residence in Cambridge, Massachusetts, November 28, was a director in the Boston Woven Hose & Rubber Co., Cambridge. Mr. Bennett was born in Somerville, Massachusetts, 62 years ago, educated in the public schools of that city, and entered the banking business, but for years has been connected with electric light and power companies in New England and was identified with several other corporations. He is survived by his widow, three sons and one daughter.

A MANUFACTURER OF WEBBING.

Alfred C. Woodward, of the Victoria Webbing Co., North Abington, Massachusetts, died December 10, at Redlands, California, where he had gone in the hope of regaining his health. About the middle of October he had retired from business and leased his factory to his brother, George Woodward.

Mr. Woodward was a native of England, coming to this country at the age of 13 years and from that date being engaged in the webbing business. He was for a time manager of the Brighton mills, at Passaic, New Jersey, and for several years a member of the firm of Dean, Chase & Co., and manager of their goring factory at Rockland, Massachusetts, previous to establishing the Victoria company about 22 years ago.

PHOTOGRAPHS OF THE BRAZILIAN RUBBER INDUSTRY.

With the close of the great Panama-Pacific International Exposition, San Diego, California, comes a matter that may interest some in the rubber trade. It will be remembered that a wonderful collection of pictures illustrating the Brazilian rubber industry was exhibited, and these photographs are now to be sold. A complete list of them may be seen at the office of THE INDIA RUBBER WORLD, or by communicating with Dr. Eugenio Dahne, care of the A. T. Deer Co., Hornell, New York.

FACTORY DEDICATION AT LA CROSSE.

The La Crosse Rubber Mills Co., La Crosse, Wisconsin, dedicated the new addition to its plant on December 5, by a concert and ball, which was attended by over 5,000 persons. The new building was lavishly decorated, the second story used as a cloak room, the third as a cafeteria, where refreshments were provided, and in the upper was given an orchestral concert, during which addresses of welcome were made by President Hirshheimer, Secretary A. P. Funk and Treasurer A. S. Funk. The floor was then cleared for dancing, in which hundreds participated until the small hours of the morning. The affair was one of the most notable events in the history of La Crosse.

The new building is of modern, fireproof, concrete and steel construction, 210 feet long. The first floor will be used as a stock and shipping room, the other three for the manufacture of rubber footwear. The company now employs 675 persons. When the new building is equipped, it is estimated that there will be room for 1,400 workers in the entire plant, and the capacity will be increased to 25,000 or 30,000 pairs a day.

THE ANNUAL BANQUET AND MEETING OF THE RUBBER CLUB.

THE annual banquet of The Rubber Club of America, Inc., will be held at the Waldorf-Astoria, New York City, on the evening of January 8, at 6:30 p. m. The elaborate arrangements and interesting program prepared for this occasion will far surpass all previous efforts. The great interest shown by the members of the Rubber Club in this event promises a much larger attendance than that of a year ago.

Colonel Samuel P. Colt will be one of the speakers. Hon. William H. Taft will speak on "After the War, What?", and the subject of Bishop Du Moulin's speech will be, "The World Unrest." The address of F. A. Vanderlip will be a special message to the rubber trade.

The boxes in the banquet hall will be at the disposal of ladies and other guests, after 9:00 p. m., affording them an opportunity of hearing the after-dinner speakers.

The annual meeting will be held at the Waldorf-Astoria, January 8, at 2:30 p. m. The officers' reports will be submitted and the following nominations for directors during the ensuing year will be voted upon:

William E. Bruyn, L. Littlejohn & Co., New York City.
Van H. Cartmell, Kelly-Springfield Tire Co., New York City.

Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio.

H. Stuart Hotchkiss, United States Rubber Co. System, New York City.

William J. Kelly, Arnold & Zeiss, New York City.

P. W. Litchfield, Goodyear Tire & Rubber Co., Akron, Ohio.

J. S. Lowman, Philadelphia Rubber Works Co., Akron, Ohio.

W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.

Charles T. Wilson, Charles T. Wilson Co., New York City.

Tracy S. Lewis, Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut.

John A. Lambert, Acme Rubber Manufacturing Co., Trenton, New Jersey.

Charles A. Daniel, Quaker City Rubber Co., Philadelphia, Pennsylvania.

The annual meeting of the retiring board of directors will be held at the Union League Club, New York City, January 6, at 12:30 p. m.

The following division meetings will be held January 8, at the Waldorf-Astoria: The Mechanical Rubber Goods Manufacturers' Division, 1:30 p. m.; the Rubber Sundries Manufacturers' Division, 11 a. m.; the Fiber and Rubber Sole Manufacturers' Division, 10:30 a. m.

IMPROVED PACKING OF PLANTATION RUBBER.

THE Rubber Club of America, Inc., through its efficient Secretary, interviewed 60 leading rubber manufacturers upon the subject of improved methods of packing rubber. The following digest of suggestions contains much of value:

1. That a heavy paper be placed inside the boxes.
2. That rubber be packed in muslin or sheeting bags and then boxed.
3. That boxes be made to hold between 200 and 300 pounds to lessen handling.
4. That boxes be of a nature to permit the taking down and reassembling without the removal of binding iron and nails.
5. That cases be lined with tin and made stronger.
6. That one grade of rubber be placed in a case and that the top layers be of no better quality than the layers beneath it, in order to avoid deceiving the importer.
7. That a standard for the various grades of rubber be fixed by the Rubber Club in connection with the Rubber Importers' Association.
8. That a case be devised that has some practical method of opening the lid for inspection, to which cases of rubber are sub-

jected at various ports, without splitting it all to pieces and at the same time permitting of a fastening that would stand shipping.

9. That interior finish of cases be smooth and the joints made closer.

10. That a certain amount of soapstone be placed between the sheets of rubber to avoid moisture from sweating.

11. That hardwood cases be used.

12. That great care be used in cooping packages.

13. That rubber be baled and burlapped.

14. That the present Japanese Momi cases be fastened securely around both end edges and also around the middle, both endwise and crosswise of the package, with metal strapping.

15. That in the case of Venesta boxes metal straps around all edges be nailed instead of riveted.

16. That less rubber be packed in cases.

17. That Jelutong and Red Serayah wood be used.

18. That a larger package be used divided into compartments in the middle to avoid rubber shaking down to one end of chest in transit.

19. That a rapidly revolving wire brush be applied to the interior of the box on a suitable vacuum cleaning nozzle.

20. That wider box stripping and special care as to the placing of nails be used.

21. That more care be given to the placing of the inscription on boxes of rubber "Store Away From Boiler."

22. That greater care be given to the unloading and reloading of ships and less handling take place in the warehouse.

23. That rubber be packed dry and not damp, causing a shrinkage above the 2 per cent allowed by sellers.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[242.] Names and addresses of manufacturers of the following are requested: Cartons, inner tube boxes, sheetings, liners, tapes and heavy gage sheet zinc for cutting tables.

[243.] A rubber company wishes to buy washed and dried rubber in ton lots.

[244.] A correspondent wishes to be placed in communication with an engineer or firm of engineers who specialize in constructing and mechanically equipping new tire plants.

[245.] Information is desired concerning the substance and manufacture of shellac compositions resembling hard rubber.

[246.] Names of manufacturers of tire valves and sundries have been requested.

[247.] A correspondent wishes to be placed in touch with manufacturers of tire fabrics, particularly breakers, thread and chafing fabrics, as well as tape.

[248.] Information is requested, with a view to purchase, regarding a machine that will put a head on transparent dipped rubber goods such as balloons, nipples, etc.

[249.] The address of a manufacturer making steam cure splicing apparatus is desired.

[250.] A list of solid tire manufacturing concerns has been requested.

[251.] Manufacturers of inner tubes constructed of rubber and cotton fabric are sought.

[252.] A correspondent desires to know where to obtain candle tar.

[253.] Names and addresses of firms manufacturing machinery for extracting rubber from the guayule plant are requested.

[254.] An inquirer wishes to know what concerns make ball-bearing hand stitchers.

[255.] Names of manufacturers of dental rubber are requested.

[256.] A correspondent wishes to be placed in touch with manufacturers of tri-nitro-benzene.

[257.] Important manufacturers of rubber, celluloid and asbestos goods in Spain are eager to subscribe to American publications containing, regularly, information of interest to celluloid manufacturers.

[258.] An inquirer wishes to know where the different varieties of rubber seed may be obtained.

[259.] A correspondent asks who manufactures rubber gloves with cloth lining.

[260.] The names of makers of rubber sheet cutters or choppers are desired.

[261.] A correspondent requests information concerning manufacturers of woven cotton hose jackets.

[262.] Firm names and addresses of concerns manufacturing machines for cutting square hydraulic packing and pure gum strip packing are sought.

[263.] Names of manufacturers of test piece grinders and cutters are desired by a rubber laboratory.

[264.] A correspondent asks who manufactures the Rubin Duplex water bottle.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in Russia, with a branch office in the United States, would like to communicate with American manufacturers of garters, etc. Report No. 23,241.

A manufacturer of pharmaceutical products in Switzerland is in the market for collapsible tubes and sprayers for bottles. Report No. 23,248.

Representation of American manufacturers of garters is desired by a firm in Brazil. Report No. 23,302.

A man in Brazil is in the market for garters. Report No. 23,319.

A firm in India desires to communicate with American manufacturers and exporters of rubber heels. Report No. 23,323.

A Swiss firm is in the market for rubber cloth, rubber balls, tennis balls and raincoats. Report No. 23,325.

THE RUBBER CLUB OF MANAOS.

The *Clu^l da Seringueira* is the name of an agricultural association recently formed in Manaus for the purpose of advancing the rubber planting industry of Amazonas, Brazil. "*A Seringueira*," the monthly official organ of the association, was first published on July 24, 1916, and has appeared regularly since that time. Its present scope and bulletin form will be enlarged in the near future, in order to reflect the practical knowledge and general information on the rubber planting industry now available.

DRESS SHIELDS FOR READY-TO-WEAR GARMENTS.

Dress shields of rubberized fabric are soon to become a regulation part of all ready-to-wear gowns, suits and coats for women if the national campaign of a leading manufacturer succeeds. It is to be the contention that dress shields are just as necessary to a finished garment as hooks and eyes or other fasteners. The new spring garments will probably introduce dress shields to thousands of women not using them at present, so the retailer will benefit rather than suffer by the custom. As the life of a dress shield is about three months it must subsequently be replaced at the notion counter.

SAVAGE TIRE CO. DEVELOPS A SIDE LINE.

This firm has in its plant at San Diego, California, a complete equipment of metal work machines, and has begun the manufacture of the Thurston Motor Fuel Gasifier, a device for increasing gasoline mileage in motor cars and making possible the use of lower test distillate and other cheap substitutes for gasoline.

News of the American Rubber Trade.

NEW PRESIDENT OF THE GENERAL RUBBER CO.

ON his return from a five months' trip to the Far East, H. Stuart Hotchkiss, of the United States Rubber Co. System, was made president of the General Rubber Co., of New York.



H. STUART HOTCHKISS

This great company comprises the following subsidiaries: Wm. Symington & Co., Limited, London and Liverpool; the General Rubber Co. of Brazil, Manaus and Para; the General Rubber Co., Singapore, Straits Settlements, Colombo, Ceylon and Medan, Sumatra; the following rubber plantation companies: Hollandsch-Amerikaansche Plantage Maatschappij, Ashan Sumatra; Nederland Langkat Rub-

ber Maatschappij, Langkat, Sumatra, and Si Paré Paré Rubber Maatschappij, Tebing Tinggi, Sumatra.

Mr. Hotchkiss brings to his responsible position a peculiar fitness together with an unusual degree of preparedness. Thoroughly conversant with the factory side of the rubber trade though his long connection with L. Candee & Co., New Haven, Connecticut; with the administration end as a member of the Operating Council of the United States Rubber Co.; with the crude rubber end by reason of his many visits to the South American rubber centers and to the Far East, he knows all sides of his subject.

Other officers of the General Rubber Co. are as of yore, with the single exception of W. Stuart Gordon, who has become vice-president.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on December 23 are furnished by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle Street, Chicago, Illinois:

| | Bid. | Asked. |
|--|------|--------|
| Ajax Rubber Co. (new)..... | 72½ | 73 |
| Firestone Tire & Rubber Co., common | 135 | 140 |
| Firestone Tire & Rubber Co., preferred | 107 | 108 |
| The B. F. Goodrich Co., common | 59¾ | 60 |
| The B. F. Goodrich Co., preferred | 110 | 112 |
| Goodyear Tire & Rubber Co., common | 285 | 290 |
| Goodyear Tire & Rubber Co., preferred | 108¾ | 109½ |
| Kelly-Springfield Tire Co., common | 58½ | 60 |
| Kelly-Springfield Tire Co., preferred | 94 | 96 |
| Miller Rubber Co., common | 245 | 250 |
| Miller Rubber Co., preferred | 106 | 107 |
| Portage Rubber Co..... | 178 | 182 |
| Rubber Goods Manufacturing Co., preferred..... | ... | ... |
| Swinehart Tire & Rubber Co..... | ... | 87 |
| United States Rubber Co., common | 60 | 62 |
| United States Rubber Co., preferred | 111½ | 113 |

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

SCRAP RUBBER DEALERS MEET.

The Rubber Scrap Division of the National Association of Waste Material Dealers held a meeting at the Hotel Astor, December 20, 1916, with Paul Loewenthal as chairman. After disposing of the routine business there was a discussion of trade matters generally that revealed a most satisfactory understanding between the members present. The classification committee recommended that no changes be made at this time, although some corrections may be made at the summer meeting. The grievance committee reported that no cases had been submitted for adjudication since the last meeting. Observance of specifications long in force in packing material are held responsible for this. Details of the new circular, which will be issued at the regular time, were fully discussed and found satisfactory. The attendance was good, about 25 members being present, and the banquet held that evening at the same hotel an unqualified success. The next meeting will be held in March.

AJAX RUBBER CO. ABSORBS RACINE.

At a special stockholders' meeting of the Ajax Rubber Co., Inc., New York City, the recent taking over of the Racine Rubber Co., Racine, Wisconsin, by the Ajax company was ratified. This consolidation is an important one, calling for an increase of capital stock from \$5,000,000 to \$10,000,000. The Ajax company has built up a national business through a large selling organization, while the Racine company has acted as distributor and built up a very profitable business at low selling cost, and the combination of interests will add to the power of both companies. The Racine Rubber Co. will maintain its corporate existence and will practically continue, without change, its selling policy, the Ajax company being used as a holding company for Racine stock.

RUBBER COMPANY DIVIDENDS.

The Rubber Goods Manufacturing Co. paid its 71st regular dividend of 1¼ per cent on preferred stock, December 15, to stockholders of record December 11.

The Boston Woven Hose & Rubber Co. paid the regular quarterly dividend of 3 per cent on common stock and semi-annual 3 per cent dividend on preferred stock, December 15, to stockholders of record December 5.

The Kelly-Springfield Tire Co. has declared a quarterly dividend of 1½ per cent on 6 per cent preferred stock, payable January 2 to stockholders of record December 16.

The Barrett Co. has declared a quarterly dividend of 1¼ per cent on both common and preferred stock, payable January 2 to common stockholders of record December 20, and on January 15 to preferred stockholders of record January 5.

An extra dividend of 10 per cent on the common capital stock has also been declared, payable January 25, to stockholders of record December 20.

The board of directors of the Keystone Tire & Rubber Co., New York City, has declared a quarterly dividend of 2 per cent with an addition 1/3 per cent on the preferred stock and a regular quarterly dividend of 3 per cent on common stock, payable January 2 to stockholders of record December 22.

The Westinghouse Electric & Manufacturing Co. has declared a quarterly dividend of 1¼ per cent on the common stock, payable January 31, and a quarterly dividend of the same amount on the preferred stock, payable January 15, both dividends payable to stockholders of record December 30. The common dividend is an increase of ¼ of 1 per cent over the last payment.

M. M. CONVERSE.

MARQUIS M. CONVERSE, head of the Converse Rubber Shoe Co., Malden, Massachusetts, was born in Lyme, New Hampshire, October 23, 1861. After attending the district school



M. M. CONVERSE.

there he completed his education at the Thetford (Vermont) Academy, and at the age of 18 went to Sherbrooke, Province of Quebec, Canada, for about a year, as telegraph operator.

Coming to Boston in 1880, he entered the department store of Houghton & Dutton, where he officiated for a year as buyer, and for the

next five years as superintendent. His health then giving away, he was warned by his physician that he must go to the country. At Lebanon, New Hampshire, he then bought the small department store of G. W. Houghton, a brother of Samuel Houghton, of Houghton & Dutton, and the originator of the department store idea. There he remained until 1887 when, with health regained, he returned to Boston, and with Henry L. Pike formed the partnership of Converse & Pike and assumed the selling agency in that city of the Wales-Goodyear line of rubber footwear.

The new firm secured comparatively small space on the second floor of a building near the large store of W. L. Sage, at that time probably the principal rubber jobber in Boston. Within a few days, Mr. Sage, who, it will be remembered, always dressed in the height of fashion and rather showily, walked into the Converse & Pike establishment and introduced himself as "William Lincoln Sage, your competitor across the street." Taking it for granted that the young men knew nothing about the business, he at once offered them the opportunity to look over his establishment and see the arrangement of floor space and the building of bins for sorting the goods. Not only that, but he offered to impart to them any knowledge he might have regarding the credit of such customers as they might sell to, and in other ways showed his good will toward this competitor, which, in a facetious way, he had dubbed "the little pint cup rubber house."

In 1899 Mr. Converse had a nervous breakdown. Energetic and ambitious, he had worked for years without taking a vacation, and much of the time doing two or three men's work every day. The result was inevitable, and for three years he was obliged to remain out of business.

Having recovered his health, in 1902 he became the president of the Beacon Falls Rubber Shoe Co.'s distributing agency in Boston, and during the next six years was highly successful in building up the New England business for this new manufacturing firm.

As showing the perspicacity of George H. Lewis, then president of the Wales-Goodyear Co., when he chose Mr. Converse as the man to push his goods to the New England trade, he in-

sisted that the six-year contract should read that Mr. Converse should work but ten months out of twelve. Being a man of action, Mr. Converse demurred, but Mr. Lewis insisted on writing into the contract that he should keep away from business entirely during July and August of each year; that if at any time he attended to any details of business during those months, the contract should terminate.

In 1908 Mr. Converse determined to go into manufacturing on his own account, and established the Converse Rubber Shoe Co., building a small factory in the Edgeworth district of Malden, Massachusetts. His able management continued, and in the summer of 1916 the factory was greatly enlarged, more than doubling its capacity, and yet the demand for its goods was even greater than the factory could supply.

Mr. Converse is a man of quiet, forceful manner, with a wealth of original ideas, as is proved by his progress in the line to which he has devoted the greater portion of his business life.

PERSONAL MENTION.

Jesse E. La Dow, of the Mansfield Tire & Rubber Co., Mansfield, Ohio, is on the briny deep on his way presumably to the Far East; at least he wrote from Yokohama in November, having left Vancouver 15 days before on the Empress of Japan. The story of the memorable trip published in the "Mansfield News" is most interesting. However, one statement is, to say the least, remarkable. He says: "Our steamship was in sight of the Azores." Pretty far sighted to see the Azores from the Northern Pacific!

Mr. La Dow does far better, however, in a letter from Japan to the "New York Herald." There he cites the wages of the Japanese factory workers which are only one-tenth of what they are in the United States; in fact, constitute the lowest factory wages in the world. When the big Japanese rubber mills get into rubber lines where labor is the biggest factor, competition will be difficult, to say the least.

The many friends in the trade of Robert B. Baird, vice-president of the Rubber Trading Co., will be glad to learn that he has returned to his desk. Robert L. Baird has just returned from a trip to Ceylon.

Gove & French, Inc., New York City, announce that Walter H. Bass is now associated with the company.

Mr. and Mrs. George W. Ryan, of East Orange, New Jersey, announce the engagement of their daughter, Miss Helen Hathaway Ryan, to Collier W. Baird, son of Mr. and Mrs. William T. Baird, and assistant treasurer of the Rubber Trading Co., 9-15 Murray street, New York City. Mr. Baird is a graduate of Yale Sheffield, class of 1910, and is a member of the Yale and Essex Country Clubs and of Essex Troop, with which he recently served on the border.

Rawson R. Cowen, son of the late Robert Cowen, has been added to the selling force of the New Jersey Rubber Co., Lambertville, New Jersey, rubber reclaimers, and will travel in New York, New Jersey and Pennsylvania.

O. D. Garretson, secretary and treasurer of the Electric Hose & Rubber Co., is president of the Manufacturers' Association of Wilmington (Delaware), also of the Employers' Association, and takes an active and enthusiastic interest in all matters making for the betterment of Wilmington as an industrial and home center.

Richard Weil, manufacturers' agent, well known in the East Indian crude rubber trade, has returned to the Far East after a two weeks' business sojourn in the United States. He expects to return to New York in June, 1917.

F. G. Hettell, having been associated with Parker, Stearns & Co., druggists' sundries manufacturers, Brooklyn, New York, as superintendent for over 25 years, has resigned to take effect January 1, 1917.

THE MANAGER OF THE "CANADIAN CONSOLIDATED."

J. A. WADE, who has recently been appointed manager of the Montreal factories of the Canadian Consolidated Rubber Co., Limited, is a man of wide rubber knowledge, 20 years' experience, and so particularly well equipped to weld together the several factory units in Montreal under the supervision of a



J. A. WADE.

central authority constantly in touch with the mills. His varied associations have embraced not only many of the manufacturing departments of the Dominion Rubber System, but both the factory and sales departments of a prominent rubber firm in the United States.

In 1895 he entered the employ of the Revere Rubber Co., Chelsea, Massachusetts. After four years' training in the factory he was transferred to the sales division to be-

come familiar with costs, selling methods and general office routine. There he remained four years more and then went on the road selling general rubber goods. Later, hearing of contemplated changes at the plant of the Canadian Rubber Co., of Montreal, he arranged to join the staff as assistant manager of the mechanical rubber goods division, and since that time has been associated with the mechanical line except during 1912 and 1913, when he was general superintendent of the B. & R. Rubber Co.'s factory at North Brookfield, Massachusetts.

Mr. Wade not only knows rubber manufacture well, but he has a keen insight of human nature. His success is due, in large measure, to constructive organization of the force under him. Superintendents, foremen and the operatives generally have confidence in his leadership and feel safe in his hands. That efficiency in every detail is to be encouraged may be seen in the weekly meetings of the foremen of his various departments, at which ways and means to improve the service are discussed. With the able assistance of Messrs. F. Jamieson and Henry Poole, superintendent and assistant superintendent, respectively, Mr. Wade's regime promises to be notable.

PAN-AMERICAN AERONAUTIC EXPOSITION.

New York is to have an aeronautic show. The first Pan-American Aeronautic Exposition will be held in Grand Central Palace, February 8 to 15, under the joint auspices of the National Automobile Chamber of Commerce, the Aero Club of America, the Pan-American Aeronautic Federation and the American Society of Aeronautic Engineers. Howard E. Coffin, of the Hudson Motor Car Co., is chairman of the Exposition.

Details have not been completely worked out, but it is probable that the motor and accessory manufacturers will participate. The Society of Automobile Engineers has extended its activities to include aeronautics, and will hold a technical session during the exposition for the discussion of present developments and possibilities of airplane engines. The S. A. E. standards committee is being reorganized in order to carry its work of standardization into the aeronautic field.

JUDICIAL DECISIONS.

BUFFALO SPECIALTY CO. V. INDIANA RUBBER & INSULATED WIRE CO. The case here reported was an appeal from the District Court of the United States for the District of Indiana, the appellant having brought suit to restrain infringement of all the claims of patent No. 578,551, granted to E. C. Duryea, March 9, 1897, for improvements in vehicle tires.

The device of the patent consists in a pneumatic tube or bicycle tire treated internally with a semi-liquid compound which, when a puncture occurs, is forced by the action of the compressed air within the tube into the aperture, and upon becoming exposed to the air thereby congeals and thus repairs the leak. The fluid, known as "dope," was not patented and, according to the patentee of the tube, may consist of any liquid or semi-liquid which will retain its free-flowing characteristics while contained within the tube, but will coagulate when exposed to the external atmosphere.

Infringement was based upon the following facts: The appellant was engaged in manufacturing and selling "dope"; the defendant, in making and selling pneumatic bicycle tires. The latter, being on November 5, 1898, the owner of the patent in suit, sold and conveyed it to the appellant's predecessor in title, the Buffalo Specialty Manufacturing Co., and took back, as a part of the transaction, what was in the transfer agreement termed "a shop license under said letters patent," granting the right to manufacture and use the dope, but withholding the right to its manufacture for sale except in a local retail way from the factories of the Indiana Rubber & Insulated Wire Co., and Peoria Rubber & Manufacturing Co., respectively. The appellee thereupon proceeded to manufacture the doped tire for over 11 years, when the business with the Chicago house of Sears, Roebuck & Co. attained immense proportions.

The appellant's contention was that it had no knowledge of the action of the appellee in building up such a large trade until about the time of the suit; that such action was in violation of the shop agreement, the true intent of which, it claimed, was that the appellee should make and use or make and sell the invention only in a local retail way from its two factories.

At the time this suit was begun the appellee also brought suit in an Indiana State Court for reformation of the contract or shop license; also for an injunctive relief, and damages. No complaint was made of the sale of "dope" as such, but only of its sale as an element of the tire of the patent.

The court dismissed the bill at the appellant's cost for want of equity, a decision which was afterward affirmed on appeal. This decision was pleaded as *res adjudicata* (a matter already settled).

The appellant's claim of infringement was based upon the proposition that the appellee, having breached the license contract by making and selling the device of the patent in quantities, became an infringer. The District Court sustained both non-infringement and the plea of former adjudication, and dismissed the bill for want of equity. This action of the District Court was assigned for error.

The Circuit Court of Appeals, Seventh District, before which the appeal for assignment for error came, held that the shop license authorized the defendant to manufacture in unlimited quantities tires with the patented device, the only restriction being upon the sale of the dope; this being particularly true in view of the fact that there had been a long acquiescence in the defendant's manufacture of tires. [The Federal Reporter, Vol. 334, pages 334 to 336.]

L. A. Watts, for three years manager of The Republic Rubber Co. of Texas, has been appointed general factory purchasing agent, with headquarters at the main plant, Youngstown, Ohio. R. E. Ratcliffe, for two years in charge of mechanical sales at The Republic Rubber Co. of Texas, succeeds Mr. Watts.

TRADE NOTES.

The United States Rubber Co. has acquired the business of the McCord-Norton Co., St. Joseph, Missouri, which will be continued under the same name as a branch store of the first-named company.

The recent fire at the Philadelphia (Pennsylvania) plant of The Barrett Co. was confined to one department, the loss being approximately \$25,000, fully covered by insurance. Plans for rebuilding have been prepared and the work will be completed and new equipment installed within 60 days.

The Cravenette Co. has been obliged, on account of increased business, to move to larger quarters on the seventeenth floor of the Hess Building, 354 Fourth avenue, New York City.

Extensive additions are being made to the Granby, Quebec, factory of the Canadian Consolidated Rubber Co., Montreal, Canada.

Eastern factories are so congested with orders that the Portland Rubber Mills, Portland, Oregon, has been asked to bid on an order for 3,000,000 small rubber washers. Incidentally this shows to what extent this practical little rubber device is used.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has established a bonus system for its salaried employees, similar to that which has been in operation for some time among wage earners. The bonus, paid monthly, is 8 per cent, provided absences and tardiness do not exceed six hours, or more than three occasions. Those who have lost no time receive an additional 4 per cent.

A new warehouse of reinforced concrete with outside walls of solid pressed brick, has been added to the Regina (Saskatchewan) branch of the Canadian Consolidated Rubber Co., Limited. The building is designed for five stories and basement, but has for the present two stories and basement. It is 50 by 100 feet wide with a loading platform 50 by 13 feet, facing the railway spur track, and contains all the latest improvements. The Dominion rubber factory of this company at St. Jerome, Quebec, is also being enlarged to meet the increased demand for "Fleet Foot" shoes.

Owing to constantly increasing business in its surgeon's gloves, the Halifax Rubber Co., Halifax, Pennsylvania, is enlarging its plant and installing new machinery and equipment.

The Philadelphia (Pennsylvania) office of the Goodall Rubber Co., Inc., is now located at Eleventh and Race streets, and the New York City office and warerooms at 72 Murray street. These changes afford three times the former wareroom space in both cities.

The Habirshaw Electric Cable Co., 10 East Forty-third street, New York City, has let a contract for the construction of a two and three-story addition to its manufacturing plant at Yonkers, New York, 200 by 300 feet.

The Electric Cable Co., Bridgeport, Connecticut, has awarded a contract for a four-story addition 57 by 130 feet.

Mulconroy Co., Inc., has removed to more commodious quarters at 528 Fourth avenue, Pittsburgh, Pennsylvania, where a full stock of the Mulconroy line of hose, "7-League" sewed leather-soled rubber boots, etc., will be carried.

Owing to the restriction of imports during the past year, there has been an unusual development of the chemical industries in the United States. There has been a large increase in the number of by-product coke plants which are utilized in the production of many compounds formerly imported from Germany. The products referred to include the following that are used in the rubber industry: benzol, solvent naphtha, toluol, carbolic acid, and cresylic acid.

The Court of Appeals has ordered L. G. De Cant to pay for the \$1,000 worth of stock in the C. A. White Rubber Co., Watertown, New York, which he subscribed for but never received, the money to go to the creditors in bankruptcy of the company. This case has been in the courts for a number of years.

K. V. Hawby, a Dane, and his brother, Axel S. Hawby, having pleaded guilty to shipping dental rubber as passengers' baggage on Scandinavian-American liners, were recently sentenced to ten days in the Tombs, theirs being the first prison sentences to be imposed on shippers who violated United States customs laws in attempts to run the British blockade.

The Merchants' Association of New York has just issued an important pamphlet opposing government ownership and operation of public utilities, and advocating exclusive regulation of all railroads by the Federal Government. It presents a masterly summing up of logical arguments that the Association's Committee on Transportation will support before the Newlands Commission, which is about to begin an investigation of this entire matter.

The Republic Rubber Co., Youngstown, Ohio, recently received an order for railway hose the volume of which doubles the amount of this class of business that the company has had for years.

Work has been commenced on the addition to the plant of the New York Rubber Co., Beacon, New York. The new building will be two stories high and 50 by 100 feet.

The Kelley Rubber Co., Cleveland, Ohio, will increase its output as soon as a suitable factory building can be located.

The Goodall Rubber Co., Inc., Philadelphia, has moved to larger quarters in the Commercial Building at Eleventh and Race streets. For a number of years it has been located at 19 North Seventh street.

A Zanesville, Ohio, brick company recently closed a contract for 20,000,000 bricks to be used for additions to Akron rubber factories.

A new rubber factory devoted to the manufacture of druggists' sundries and toys is projected by C. V. Martin, of New-castle, Pennsylvania, to be located at Norwalk, Ohio, in the very early future.

Work is being rapidly rushed on the buildings of the Brunswick-Balke-Collender Co.'s factories in Muskegon, Michigan. Machinery installation is expected to commence January 1.

The Millbury Rubber Co., Millbury, Massachusetts, notice of whose incorporation appears elsewhere in this issue, has taken over the plant of the Stoddard Rubber Co., Inc., at Millbury, the latter company having discontinued business. The Millbury company manufactures four sizes of non-skid tires. The present capacity of the mill is 160 tires a day, and it is planned to increase this shortly to 300.

The fiftieth anniversary of the founding of The Loewenthal Co., Chicago, Illinois, will be celebrated on New Year's Day. This well-known waste rubber concern operates extensively throughout the country and also carries on a large export and import business.

Kaufman & Rosenberg, dealers in scrap metals and rubber, have moved to 2994 Park avenue, New York City, where they occupy a three-story brick building, provided with the latest equipment for rapid and efficient shipment.

Wallace L. Gough & Co., dealer in crude rubber, gutta percha and balata, has joined offices with Richard Gough, Corn Exchange Bank Building, 11-19 William street, New York City, with A. T. Mason as associate.

AMAZON TIRE EXPANSION.

The Amazon Tire & Rubber Co., Akron, Ohio, has appointed Owen Moynihan as eastern district manager with headquarters in New York City. Among the recent additions to the staff of Amazon dealers may be mentioned Ralph E. Becker, Buffalo, New York, and the Strong, Carlisle & Hammond Co., Cleveland, Ohio.

INDEPENDENT RUBBER CO., LIMITED.

In THE INDIA RUBBER WORLD of December 1, 1916, was published an account of the formation of a new corporation, the F. E. Partridge Rubber Co. In that notice it was stated that this corporation had leased the factory of the Independent Rubber Co., at Merritton, Ontario. This is not the fact. The Partridge Company has leased the plant of the Independent Tire Co., at Guelph, Ontario.

The Independent Rubber Co., Limited, at Merritton, has not discontinued business, nor has it leased its factory. On the contrary, it is running to full capacity on orders, the demands for its rubber footwear having become so great that the management has recently been obliged to decline business.

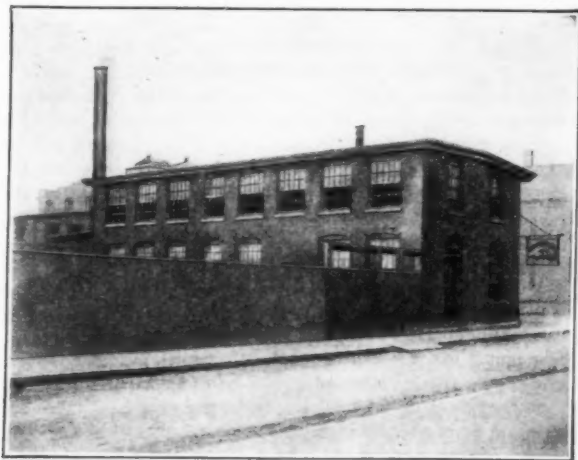
S. A. E. EXTENDS ACTIVITIES.

The Society of Automobile Engineers, whose scientific investigations and standard specifications have done so much for the advance of the automobile industry, has extended its activities to the aeronautic, tractor and motor boat fields. The recently established Buffalo section will devote considerable attention to this work, and the newer activities are prominently reflected in the program of papers to be read at the annual meeting of the society, to be held in New York City, January 11, at the time of the automobile show. During the First Pan-American Aeronautical Exposition, to be held at Grand Central Palace, February 8 to 15 inclusive, a technical session of the society will also be held.

NEW PLANT OF THE HENRY L. SCOTT CO.

The Henry L. Scott Co., Providence, Rhode Island, builder of precision testing machines for rubber, cotton fabric, cords and other materials, has recently occupied its new factory at Blackstone and Culver streets. As shown by the accompanying illustration, the plant consists of a two-story building of heavy mill construction with basement 35 by 68 feet; a boiler house 18 by 35 feet in the rear; and a storehouse 22 feet square at one side.

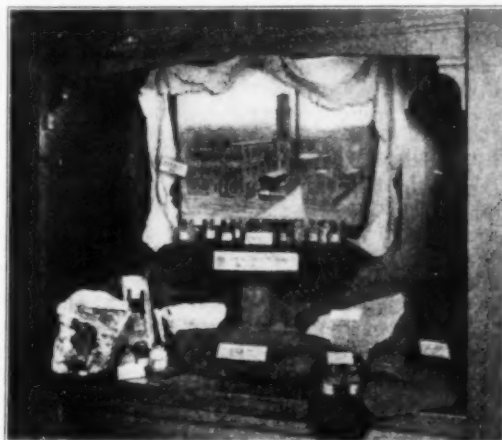
The main building is equipped with sprinklers and safety devices throughout. Exceptionally large windows have been



provided and the shop is otherwise well lighted, both gas and electricity being employed. All machinery is operated by electric motors and materials are carried from floor to floor by an electric elevator. The first floor is devoted entirely to the manufacture of machine parts. Castings and raw stock are stored in the basement, and the snagging and painting are also done there. On the top floor are located the offices, drafting room, assembling and shipping departments. Visitors interested in the testing of materials and the obvious advantage of buying and selling them by specification are welcome.

ROSENWALD & WEIL ARE PROGRESSIVE.

The accompanying illustration was made from a photograph showing a portion of the exhibit that was recently held in the Chicago showrooms of Rosenwald & Weil, maker of rubber



products and rubberizers of all kinds of fabrics. There were shown the raw materials, such as crude rubber, chemicals, compounding ingredients, and fabrics used in the manufacture of the various products made in the Chicago plant, a picture of which was appropriately draped with a sheet of the best plantation crêpe rubber.

In addition to the complete line of rubber clothing, there was shown a variety of rubber specialties, including "Imperial" sheeting, piano bellows cloth and rubber cement, made by this company and distributed by their selling force all over the world.

DRY CLIMATE TIRE COMPANY MEETING.

At the annual stockholders' meeting of The Dry Climate Tire Manufacturing Co., Arvada, Colorado, held December 2, 1916, the following directors were elected: E. A. Austin, president, Boulder, Colorado; W. J. H. Doran, president Denver Manufacturing Association; George P. McKenney, Denver, Colorado; R. S. Van Tassell, Cheyenne, Wyoming; C. H. Allyn, Hardin, Colorado; Daniel A. Lord, Denver; J. F. White, Arvada.

The auditors' report showed a substantial profit, indicating future dividends. The purchase of additional equipment of molds, presses and vulcanizers was authorized to increase production in accordance with present demands.

THE BUCYRUS RUBBER CO.

At a stockholders' meeting of The Bucyrus Rubber Co., Bucyrus, Ohio, on December 4, the following directors were elected: George Donnenwirth, W. A. Blicke, A. G. Stoltz, H. A. Paxtion, A. J. Richards, Phil. Browassky, Phil. Heater, William Schwenck, and Jacob Colter. On December 8, the directors met and elected the following officers: Phil. Heater, president; George Donnenwirth, vice-president; W. A. Blicke, treasurer; C. P. Mader, secretary. The affairs of the company were reported to be in good condition, and it is anticipated that business for next season will be greatly increased.

POST ACQUIRES BANNER RUBBER SHOE PLANT.

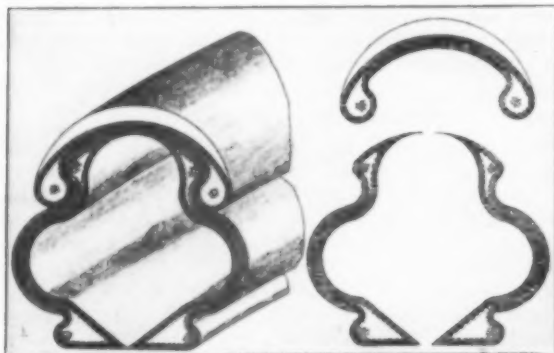
The plant of the old Banner Rubber Co., St. Louis, Missouri, which has been idle since that firm's retirement from the rubber shoe business several years ago, has been acquired by the Post Tire & Rubber Corporation, of New York City, and will be opened at once with a large force. The factory has a floor space of 70,000 square feet and a daily capacity of 1,200 automobile tires and 15,000 pairs of rubber boots and tennis shoes.

TIRE PRICES MAY BE ADVANCED.

FOLLOWING the rise of about 12½ per cent. in tire prices early last year is now seems probable that prices will soon be advanced again from 15 to 20 per cent. Dealers usually order heavily about this time for spring delivery, and the fact that two of the largest manufacturers have instructed their agents to accept only orders for immediate shipment seems to foreshadow a general advance. This refusal of forward orders is due to the unsettled conditions affecting crude material prices. In this connection it is a somewhat anomalous fact that every production cost, including compounding ingredients and labor, has long since advanced greatly, except rubber itself. Until October rubber had actually been a little lower than a year ago, but during the past three months the trend of the market has been upward to an advance of about 20 per cent. Tire building fabric now sells at about double the prices prevailing a year ago. Oxide of zinc, lampblack and all compounding ingredients are relatively high, and whiting has nearly doubled in cost, so that on the present price schedule the margin of profit in tire manufacture is small.

A THREE-SECTION AUTOMOBILE TIRE.

A pneumatic tire that differs radically from the ordinary casing and tread construction, is the subject of the following illustration and description. This tire has two separate side walls while the tread is a separate section, as will be seen by referring to the figure on the right. The conformation of the



outer ends of the two side walls and both sides of the tread is such that when assembled with the inner tube, a few pounds' inflation suffices to lock the sections firmly together.

Among the advantages claimed for this novel construction are greater protection to the tube, and danger of punctures and blow-outs minimized. The tread is readily interchangeable, as the side walls of a given size are identical; moreover, the tread may be used on any corresponding standard tire, making the retreading of a worn-out tire a very simple matter. It is also apparent, from the inventor's claims, that when the sectional tire becomes hopelessly worn or damaged, in the great majority of cases, it will be necessary only to replace one-third of the tire to make it serviceable again. [D. C. Roberts, Trenton, New Jersey.]

ASBESTOS FOR TIRE FABRIC.

Long-fibre asbestos spun into thread has been suggested and even used to a certain extent as a substitute for cotton in the manufacture of tire fabric. While some experts hold to the opinion that it cannot have the tensile strength of cotton fabric, its possibilities in connection with an unusually broad breaker strip of woven wire extending about the side walls are particularly interesting at a time when the Egyptian cotton crop is restricted; the Sea Island crop is threatened by the ravages of

the boll weevil; the total American cotton crop is nearly 3,000,000 bales below normal; and the cotton demand for miscellaneous purposes is unprecedented. The breaker strip referred to is composed of fine wire, bound with asbestos, woven into fabric and rubberized. Time will substantiate the sweeping claims of superiority based upon strength and nonconductivity of heat if they be well founded. Meanwhile, it is certain that mineral asbestos is not rotted by moisture percolating through cuts in the tire tread and carrying along some of the sulphur of vulcanization. Herein, perhaps, lies its chief claim to notice as a possible substitute for cotton tire fabric.

AUTOMOBILE ACCESSORY WEEK.

THE seventeenth Annual National Automobile Show under the auspices of the Motor and Accessory Manufacturers will be held at Grand Central Palace, New York City, January 6 to 13, and at the Coliseum and First Regiment Armory, Chicago, January 27 to February 3. More than 340 exhibitors have been allotted space, most of them at both shows. In this list of exhibitors are the following names which are familiar to readers of THE INDIA RUBBER WORLD:

Adamson & Co., Inc., New York City.
Asch & Co., Inc., New York City.
Brunswick-Balke-Collender Co., New York City.
Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.
Eastern Rubber Co., Philadelphia, Pennsylvania.
Essex Rubber Co., Trenton, New Jersey.
Eureka Rim Compressor, Inc., Addison, New York.
General Tire & Rubber Co., Akron, Ohio.
Hill Insulating & Manufacturing Corporation, New York City.
Mattson Rubber Co., Lodi, New Jersey.
Mutt, L. J. Co., Boston, Massachusetts.
Pittsburgh Electric Specialties Co., New York City.
Rubber Insulated Metals Corporation, Plainfield, New Jersey.
Western Electric Instrument Co., Newark, New Jersey.

There will be 98 cars exhibited, while 218 accessory manufacturers will display their lines. Many elaborate arrangements and novel effects are being planned for this exhibition.

SOCIETY OF AUTOMOBILE ENGINEERS.

The week in New York City will be a busy one. The Society of Automobile Engineers, which now has 370 members, will hold its annual meeting during the week. On Tuesday there will be a preliminary session of the Standards Committee. The regular business meeting will be held Wednesday, at which officers will be elected and proposed constitutional amendments discussed. The afternoon session will be devoted largely to aviation subjects. Thursday will be given over to professional papers and discussion of automobile subjects. A buffet luncheon will be served at noon. This meeting will be held at the Engineering Societies Building, 29 West Thirty-ninth street.

The annual banquet will be held at the Hotel Biltmore, Thursday evening. Three short addresses on subjects of interest to the automobile industry will be important features. The 750 diners in a body will then attend a midnight theatrical performance as a climax to the function.

MOTOR AND ACCESSORY MANUFACTURERS.

The Motor and Accessory Manufacturers, which now number 260 members, will hold their thirteenth annual meeting at the Waldorf-Astoria Hotel, New York City, Wednesday, January 10 at 3 o'clock, following this with the Ninth Annual Banquet at the same hotel at 7:30 P. M. An efficient banquet committee is in charge, and the affair promises to be the banner occasion of this association. On Thursday, January 11, the board of directors will hold an important meeting at the offices of the association.

NEW INCORPORATIONS.

Batterman, Rood Rubber Co., The, October 24 (Massachusetts), \$150,000. John J. Batterman, 95 Newbury street, Boston; Warren B. Rood, 585 Franklin street, Melrose Highlands; Robert W. Daniels, 16 Harrison street, Brookline; Thomas H. Dumper, 15 Fernwick Road, Winchester—all in Massachusetts. To manufacture and deal in shoes, clothing, etc., made in whole or in part from rubber or other similar materials.

Beacon Rubber Co., Inc., December 13 (New York), \$50,000. Herbert T. Auerbach, Statler Hotel; Harold A. Forbes, 241 Maryland street, and L. B. Dietz, 40 Laurel street—all in Buffalo, New York. To manufacture rubber goods, etc.

Bering Tire & Repair Co., November 24 (Texas), \$20,000. A. C. Bering, Jr., John W. House and Hamblen Pattison—all of Houston, Texas. Principal office, Houston, Texas. To deal in tires. This company succeeds the Bering Tire & Rubber Co.

Colton Demountable Rim Corporation, December 12 (Delaware), \$2,500,000. L. R. Sheldon and L. N. Downs, New York City, and George H. Roeder, Brooklyn, New York. Principal office, United States Corporation Co., Dover, Delaware. To manufacture and deal in rims for automobiles, especially the Colton Demountable Rim.

Goshen Rubber & Manufacturing Co., October 25 (Indiana), \$5,000. Charles Noel (president and treasurer), Henry W. Pease (secretary and sales manager), and John Lash. Principal office, Goshen, Indiana. To manufacture mechanical rubber goods, rubber molds and machinery.

Guarantee Tire & Rubber Co., November 4 (Indiana), \$70,000. G. F. Kreitlein (president); C. W. Minesinger (vice-president), Walter W. Kuhn (secretary). To deal in casings, tubes and accessories.

International Rubber Sales Co., November 1 (Indiana), \$10,000. Marc Wile, Leah Wile, and Alex D. Rodgers, Jr. Principal office, Evansville, Indiana. To buy, sell and repair automobile tires and accessories.

Interstate Elastic Braid Co., Inc., December 6 (New York), \$5,000. Samuel Sagor, 336 First street, Brooklyn, New York; David G. Herman and Charles Herman, 126 East Twelfth street, New York City. To manufacture elastic braid.

Lapp Insulator Co., Inc., December 14 (New York), \$150,000. John B. Abbott, Geneseo; Harlan W. Rippey and Samuel Levy, Rochester—both in New York. Principal office, LeRoy, New York. To manufacture electrical apparatus, insulating materials, rubber, etc.

Marine Rubber & Chemical Co., Inc., The, December 9 (New York), \$1,000. James B. Pelton, 197 Penn street; Richard Murphy, 540 Fifty-seventh street—both in Brooklyn, New York, and Frank A. O'Rea, 6 Mangin street, New York City.

Metallic Auto-Tire Co., November 1 (Massachusetts), \$500,000. Constantine P. Govostos, 355 Harrison avenue, Boston; Joseph Lazarus, 25 Sea Foam avenue, Winthrop, and Alexander O. Szeitz, 53 Piedmont street, Worcester—all in Massachusetts. Principal office, Lynn, Massachusetts. To manufacture and deal in metallic tires, automobiles, etc.

Millbury Rubber Co., November 15 (Massachusetts), \$90,000. Albert W. Blackmer, J. Otis Sibley, and Ruth E. Price—all of Worcester, Massachusetts. Principal office, Millbury, Massachusetts. To manufacture and deal in all kinds of crude rubber or rubber compounds, tires, and articles made of rubber and other compounds.

Parker Collapsible Rim Corporation, August 23 (Delaware), \$3,000,000. Lawrence Angel, Cedarhurst, Long Island, New York; George J. Soden, 386 One Hundred and Sixty-first street, New York City; Sidney S. Lesser, 1935 Bergen street, and Louise Frankel, 592 Decatur street—both in Brooklyn, New York. Principal office, Delaware Charter Guarantee & Trust Co., 328 du Pont Building, Wilmington, Delaware. To manufacture and deal in rims, parts and appliances in connection with automobiles and other motor vehicles.

Quick Lock Demountable Rim Co., November 14 (Massachusetts), \$50,000. James Norrie, 78 Chauncy street, Charles F. Crowell, Room 22, Ames Building—both in Boston, Massachusetts, and James W. Stevens, 9 Summit avenue, Brookline, Massachusetts. Principal office, Boston, Massachusetts. For the purpose of holding, buying, selling and dealing in patents and patent rights and automobile accessories.

Reuter Rubber Co., November 9 (New Jersey), \$250,000. George Joseph Reuter, 182 Montclair avenue; Alfred Strauss, 75 Hedden Terrace, and Frederick Seligman, 202 Fifth street—all in Newark, New Jersey. Principal office, 11 Clinton street, Newark, New Jersey. To manufacture and deal in tires and tubes.

Rubber Pachit Corporation, December 18 (New York), \$30,000. Frederic W. Rogers and Edward Goldfarb, 40 Exchange Place, and V. C. Bogardus, 140 Nassau street—both in New York City. Vulcanizing materials, tire repairing, etc.

Scientific Rubber Heel Co., Inc., December 8 (New York), \$200,000. William H. Arrington, 619 West One Hundred and Thirty-fifth street, New York City; Blanchel A. Murrelle, 1716 Caton avenue, and Ellis S. Helwitz, 1129 East Fifteenth street—both in Brooklyn, New York.

Servis Tire & Tube Co., December 1 (Delaware), \$100,000. F. D. Buck, George W. Dillman and M. L. Horty—all of Wilmington, Delaware. Principal office, Delaware Charter Guarantee & Trust Co., 328 duPont Building, Wilmington, Delaware. To manufacture and sell tires and tubes.

Standard Tire Valve Co., September 13 (Massachusetts), \$100,000. Michael F. Clarke and John Luther, 40 Central street, and John W. McCormack, Tremont Building—both in Boston, Massachusetts. Principal office, Boston, Massachusetts. To build, construct, manufacture and deal in tire valves, etc.

Triple Airless Tire Co., September 21 (Delaware), \$150,000. Andrew C. Heilman, Butler; J. M. Martin and F. W. Daugherty, Grove City—both in Pennsylvania. Principal office, Colonial Charter Co., 927 Market street, Wilmington, Delaware. To manufacture and deal in the Triple Airless tires, and other tires and rubber goods.

Tu-Shu-Tire Corporation, December 13 (New York), \$5,000. William C. Moore, 1178 Broadway; William P. Herrick, and Gerard P. Herrick, 61 East Seventy-third street—all of New York City.

United States Rubber Co., December 7 (Delaware), \$100,000. Henry B. Hubbard, 1540 Seventy-second street; John D. Carberry, 822 Greene avenue—both in Brooklyn, New York, and George H. Mayo, 159 Corlies avenue, Pelham, New York. Principal office, Corporation Trust Co. of America, 394 duPont Building, Wilmington, Delaware. To purchase, sell and deal in goods, wares and merchandise of which rubber is a component part. This company was organized to operate the business heretofore carried on by certain branch store selling companies in various parts of the United States.

Wayne Tire & Rubber Co., November 3 (Indiana), \$3,000. W. R. Britton, H. T. Whitney, E. J. Wohlfeld. Principal office, Indianapolis, Indiana. To deal in tires, accessories, etc.

FINAL SETTLEMENT OF THE PERLMAN RIM SUIT.

Through the payment of \$1,010,000 by the Standard Welding Co., Cleveland, Ohio, to the Perlman Rim Corporation, in settlement of back royalties, the famous Perlman rim suit, referred to in several previous issues of THE INDIA RUBBER WORLD, has been virtually closed, although certain legal formalities still remain to be complied with. Thus the last Stanweld debt to Perlman has been paid and the plant will henceforth manufacture rims under a Perlman license. The factory space is to be enlarged next summer to about 1,600,000 feet.

Of value for daily reference in every rubber office.—"The Polyglot Rubber Trade Directory, 1916."

PERSONAL MENTION.

John Kearns has been elected general manager of the Lee Tire & Rubber Co., Conshohocken, Pennsylvania, in full charge of manufacturing, and plans are being made for a material increase in the production and capacity of the plant under his management. Formerly Mr. Kearns was vice-president of The Fisk Rubber Co., Chicopee Falls, Massachusetts, and previous to that he organized the British Dunlop Co. of Australia, with which he was connected for 12 years.

W. M. Pound succeeds Millard Ritter as local manager of the Charlotte (North Carolina) depot of The B. F. Goodrich Co., Akron, Ohio.

E. Duffy has joined forces with the Kelly-Field Co., selling agency for the Lee Tire & Rubber Co., Conshohocken, Pennsylvania, and hereafter will devote his experienced attention to the merchandising of Lee tires. He was formerly sales manager of the Midgeley Tire & Rubber Co., and prior to that was connected with the Hartford Rubber Works Co.

H. R. Platt, recently with the Batavia Rubber Co., has been appointed assistant superintendent of the tire department of The Gordon Tire & Rubber Co., Canton, Ohio.

J. F. Thompson has been appointed general district manager of the New York branch of the Sewell Cushion Wheel Co., Detroit, Michigan.

J. D. Cary has been promoted to the position of southern district manager for the Kelly-Springfield Tire Co., New York City. Mr. Cary was formerly manager of the Atlanta (Georgia) branch, where he is succeeded by Amos W. Whaley.

George M. Martin is in charge of the new branch of the Kelly-Springfield Tire Co. at Minneapolis, Minnesota. For the past eight years Mr. Martin was connected with the Firestone Tire & Rubber Co., Akron, Ohio, as manager, respectively, of its Omaha, St. Louis and Minneapolis branches, and therefore brings a wealth of experience to his new position.

R. W. Llewellyn has been placed in charge of the branch store and wholesale depot recently opened at Columbus, Ohio, by the Kelly-Springfield Tire Co.

R. C. Bubb, of Grimley, Limited, agents for the Firestone Tire & Rubber Co., at Sydney, Australia, recently returned from an extended visit to the United States for the purpose of studying factory and export conditions. Mr. Bubb states that, although a part of the British Empire, Australia buys most of its automobiles, tires and motor car accessories from the United States.

A. E. Hertzog has been made manager of the Washington, D. C., branch of the Goodyear Tire & Rubber Co., Akron, Ohio. He was formerly employed as manager of the Baltimore branch and will now take charge of both territories. L. J. Gemmil, former manager of the Washington branch, will devote his time to looking after the government business.

George M. Stadelman, vice-president of the Goodyear Tire & Rubber Co., Akron, Ohio, is now in South America with his family. While the trip is taken mainly for recuperation, Goodyear interests in that region will doubtless claim a share of his attention.

G. W. Henne, general manager of the Mansfield Tire & Rubber Co., Mansfield, Ohio, has recently decided to turn over five acres of the company's ground to be devoted to garden purposes for the benefit of the employees. The company will plow, irrigate and supply seed for each employee who may desire to raise his own food stuffs.

Henry C. Plow, at one time treasurer of the Hartford Rubber Works, and more recently vice-president and sales manager of the Midgeley Tire & Rubber Co., has purchased and will operate the Automobile Owners' Accessory Co., Limited, of Montreal, Canada. The company will be renamed and reincorporated.

E. A. Jacob has become manager of the Portage Rubber Co.'s Des Moines (Iowa) branch. He succeeds J. W. Wildman, who has been transferred to the Chicago offices.

James G. Budd, of The Fisk Rubber Co., Chicopee Falls, Massachusetts, recently completed an 11 months' tour in the Far East, in the interests of the company's export and service department. Mr. Budd's successful mastery of about 20 different tongues and dialects peculiarly fits him for such an undertaking.

C. M. Folger, Pacific Coast manager of the Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, has been spending the last few weeks in the Hawaiian Islands, visiting Marathon distributors and gathering information on conditions in that territory.

WESTINGHOUSE TO INCREASE CAPITAL.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, will increase its capital by the addition of \$15,000,000 of common stock, provided the recent resolution of the board of directors is authorized by the stockholders at a special meeting called for February 15. All plants of the company are doing capacity business and many profitable contracts have had to be declined. The new issue of stock will permit the immediate erection of a much needed plant at Essington, Pennsylvania, just outside of Philadelphia, at an expense of \$5,000,000 to \$7,000,000.

A WELL-KNOWN INVENTOR AT WORK.

TO see men in their offices is almost as interesting as to meet them in the flesh, and it is a pleasure occasionally to have an opportunity to show the daily surroundings of those who have contributed materially to the advance of rubber manufacture. The accompanying illustration shows Arthur Jackson Wills, the well-known inventor, in his office at North Brookfield, Massachusetts, explaining the model of one of his recent inventions to Mr. Lindholm of the Pneumatic Scale Corporation. Mr. Wills is a mechanical engineer of exceptional ability, and since his association with the B. & R. Rubber Co., of North Brookfield, Massachusetts, has devoted himself with marked success to the



OFFICE OF ARTHUR JACKSON WILLS.

design and manufacture of special rubber machinery. Keen insight and a first-hand knowledge of the needs of the industry, coupled with a positive creative ability, have brought forth several time and labor-saving devices which have been adopted by leading rubber manufacturers in Europe as well as America. His automatic, carton filling machine was soon followed by a rubber overflow trimmer for rubber heels and other molded goods—his most widely known invention—while the device just recently placed upon the market is a rubber edging plaiter. It is known that more patents are pending, and it is reasonable to assume that in his future work Mr. Wills will round out a much broader sphere of helpfulness to the rubber trade.

TRADE NOTES.

The Keaton Tire & Rubber Co. has moved into larger quarters at 636 Van Ness avenue, San Francisco, California, the new two-story and basement quarters having three entrances and affording every convenience for proper service.

The Meyer Rubber Co. is erecting a plant at Massillon, Ohio, for the manufacture of automobile tires and tire accessories.

The Gillette Safety Tire Co., Eau Claire, Wisconsin, has increased its capital stock to \$1,000,000. Work is progressing rapidly on the plant, and it is expected that by March or April the capacity will be more than doubled. C. G. Race, formerly general manager of the Chicago branch, is now general sales manager at Eau Claire.

The Estabrook-McGraw Tire Co., 1646 Broadway, Denver Colorado, is a new distributing agency for McGraw tires in Colorado and extensive adjacent territory in the Rocky Mountain region.

The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio, has opened a new department for the manufacture of rubber and composition soles and heels, with Frank B. Rickaby in charge.

The Hester Tire & Rubber Co. has acquired a three-acre site in Delphos, Ohio, on the Fort Wayne division of the Pennsylvania Railroad and the Clover Leaf Route, and will there erect a series of modern two-story factory buildings, of brick and concrete construction. Each unit will be 50 by 150 feet and will contain approximately 15,000 feet of floor space. It is expected that part of the plant will be in operation by spring.

To facilitate the shipment and storage of its tires, the Savage Tire Co., San Diego, California, has added to the group of its factory buildings a warehouse of brick and steel construction. It is erected on the tracks of the San Diego & Arizona Railroad and will handle all the carload shipments, besides being used as a supplementary storehouse for raw materials and an overflow storehouse for finished tires.

The Good-Wear Rubber Co. has purchased for \$30,000, property comprising 1½ acres of ground centrally located in Elyria, Ohio. The existing buildings on this property, having a floor space of 25,000 to 30,000 square feet, will be remodeled very shortly, the company expecting to manufacture tires in the late spring or early summer.

The Porter Rubber Co., Salem, Ohio, has raised its capital stock from \$125,000 to \$250,000, because of increased business, the new stock to be taken by present stockholders. This company already has a new, modern factory with a capacity of 350 tires and a like number of tubes per day.

The Watson Suspension Wheel Co., Franklin, Pennsylvania, has raised its capital stock from \$50,000 to \$150,000. This company holds the patents for the Triple Airless tire, which is made under contract. The officers are as follows: J. M. Martin, Grove City, Pennsylvania, president; A. C. Hileman, vice-president; Fred W. Daugherty, secretary and treasurer.

The Fox-Senior Tire Co. has decreased the amount of its authorized capital of \$20,000 to \$10,000.

The assets and liabilities of The McClurg Rubber Co., Coshoc-ton, Ohio, have recently been taken over by the Midland Tire & Rubber Co., which will operate in the old McClurg company's building at Coshoc-ton. Three tires of different grades, including a cord tire, and also tubes, will be manufactured. Wilmer Dunbar will act as general manager.

The Batavia Rubber Co., Batavia, New York, has filed complaint with the Interstate Commerce Commission charging the Atlantic Coast Line Railroad, and connecting lines, with dis-

crimination in rates with respect to its articles of manufacture on shipments meant for so-called Southern Classification territory by way of Ohio River crossings. The complaint alleges that this discrimination extends to classes of tires as follows: First class, on pneumatic tires, in any quantity; second class on solid tires, any quantity; and, third class, on all others, such as tires in steel casings. The complainant asks the commission to order rates which will cause "a larger spread" between the carload and less than carload lots.

The Goodyear Tire & Rubber Co., Akron, Ohio, has also filed a petition for reclassification of freight rates on tires shipped via the Atlantic Coast Line and other railroads in the South.

The Mutual Film Corporation will equip all of its motor cars with a specially constructed non-skid tire which will write the name of Charlie Chaplin in the dust of the road three times for each wheel revolution. Between imprints of the name will be footprints of the world's champion foot-worker, on the shoe of the tire.

The Iowa Rubber Tire Co., of Bettendorf, Iowa, has recently purchased the plant formerly occupied by the American Can Co. for \$70,000. It is claimed that the company has signed three tire experts from Akron, Ohio.

The Good-Wear Rubber Co., Elyria, Ohio, is said to have commenced operating. It is estimated that the company will employ 150 men and make 300 tires and 200 tubes daily.

It is understood that the contract for erecting the Kelly-Springfield Tire Co.'s plant at Cumberland, Maryland, has been let for \$2,500,000. Building will commence March 1.

Production has begun in the newly-built pneumatic tire factory of the J. & D. Tire & Rubber Co., at Charlotte, North Carolina. George Knowles, a scientific rubber man with 16 years' practical experience in tire manufacturing, is superintendent.

At the annual sales conference of The McGraw Tire & Rubber Co., East Palestine, Ohio, December 6 to 9, S. L. Warner was appointed assistant sales manager, and R. J. Delavan, special representative. C. K. Whittaker, former Pacific Coast district manager, was made Pacific Coast district manager, with headquarters at San Francisco, California. There was a full attendance of district managers at the conference, and C. E. Miley, general sales manager, presided.

A certificate of authority to do business in Illinois has been issued to The Gordon Tire & Rubber Co., an Ohio corporation with a capital stock of \$600,000. The principal office in Illinois is located in Chicago.

EMPIRE RUBBER & TIRE CO.'S NEW PHILADELPHIA OFFICE.

The new home of the Philadelphia (Pennsylvania) branch of the Empire Rubber & Tire Co., of Trenton, New Jersey, is a large four-story and basement building centrally located at 810 North Broad street. One of the main reasons for erecting this new building was to improve the service end of the company's business, and the rear portion of the first floor, 20 by 86 feet, is given over to the service station, allowing plenty of room to run cars inside. Experts will be in charge of this department, capable of giving advice to patrons which will insure the greatest possible service from the tires.

The entire second floor is used for the stock room. It is equipped with four rows of tire racks, each 160 feet long and extending to the ceiling, three tiers high, and with accommodations for at least 10,000 tires, everything being arranged to facilitate the quick handling of stock. The storage room for the many varied products of the company is on the third floor, and a completely equipped repair shop in charge of expert tire men occupies the entire fourth floor. An electric elevator runs from the first to the top floor.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE concentration of the American rubber industry in Akron has made possible a much larger growth than if it were scattered over a larger territory. For example, the extended research work carried on by the large and wealthy companies here has advanced the industry with phenomenal rapidity, affording as it does, ever new uses for rubber.

In 1910 the population numbered only 69,000, as compared with the 51,150 people now employed here in rubber manufacture. Although every variety of rubber goods is extensively produced, the tire industry is the main element. It is claimed that Akron manufactures over 70 per cent of all the automobile tires used in the world. The past year's production of tires totals over 11,522,650. Every factory is operating to full capacity and constant additions are being made to floor space and equipment, to meet the ever increasing demand. Taking these facts into consideration, over 20,000,000 tires is considered a safe prediction for 1917.

The taxable value of the great plant of The B. F. Goodrich Co. amounts to almost half of the total of \$43,896,440 placed upon the 168 industries located in Akron and Summit County. Just how the rubber manufacturing business dominates in Akron, and the immensity of it, is shown by the following valuations for the different companies:

| | |
|---------------------------------|--------------|
| The B. F. Goodrich Co..... | \$20,392,830 |
| Goodyear Tire & Rubber Co..... | 7,631,780 |
| Firestone Tire & Rubber Co..... | 4,964,980 |
| Kelly-Springfield Tire Co..... | 1,371,930 |
| Miller Rubber Co. | 1,121,910 |
| Portage Rubber Co..... | 331,880 |
| Swinchart Rubber Co..... | 459,270 |

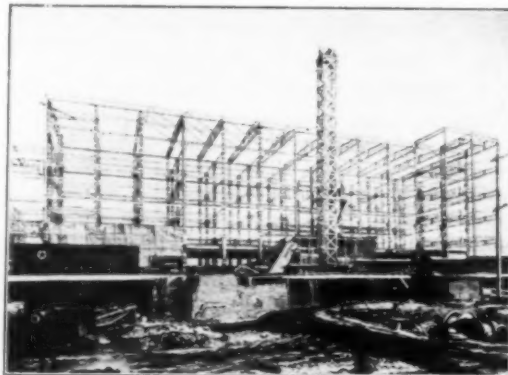
A total of \$36,220,580 is credited to the rubber manufacturing industry, more than four-fifths of the entire manufacturing activities of Akron and its suburbs.

Side by side with economic prosperity, social welfare for the benefit of the workers has flourished. The B. F. Goodrich Co. maintains a department of industrial relations, with divisions of labor, health and safety, including provision for illness, life insurance, recreation, etc. The splendidly equipped Firestone clubhouse has been previously described in these columns. The Goodyear Tire & Rubber Co. makes a specialty of athletics and also maintains a factory school. The Miller Rubber Co. has inaugurated an adjustment board among the employees of the employment department, allowing them to make minor adjustments of difficulties arising among workers. A well-equipped hospital has also been recently installed by the Miller company; an athletic field has been provided, all essential equipment for various sports being purchased by the company; and study clubs on practical business questions are being organized, with evening classes, including supper served by the labor department at actual cost.

* * *

For some time the Firestone Tire & Rubber Co. has been planning to enter the rubber footwear field, and a new department specially adapted to this line of manufacture is now in full swing. Extensive research undertaken by the company for a good substitute for leather soles—so prohibitive in cost at present—has resulted in the production of an entirely new line of fiber rubber soles and heels of sturdy quality which are now being offered to the shoe manufacturing trade. S. S. Patrick, formerly with the Beacon Falls Shoe Co., Beacon Falls, Connecticut, has been named as manager of footwear sales, and Harry D. Hamilton, formerly of the John H. Parker Co., Malden, Massachusetts, will act as footwear sales representative. P. D. Hammond is superintendent of the footwear factory. During the month of January, the complete line of footwear will be on display in Boston, Massachusetts, for the benefit of visiting buyers. The Firestone Tire & Rubber Co. is now aiming to produce

20,000 tires a day, and the accompanying illustration shows one of the new buildings in its process of expansion, designed to house all repair and mechanical departments. It is built of reinforced concrete and brick, with large steel-sash windows, and



ADDITION TO FIRESTONE PLANT.

contains approximately 86,000 square feet of floor space. Another separate building is also being erected and another story is being added to the main factory buildings.

The convention of branch managers of the Firestone company on December 12 to 14 was the first of its kind ever held. Office managers from 46 branches, traveling auditors and officials at the home office were all in attendance. The business sessions were held in the new clubhouse and there was much interesting discussion of business methods and conditions and a general exchange of ideas, which form so valuable a part of these get-together meetings.

President H. S. Firestone welcomed the visitors to the Akron office and delivered a short address. Other officers of the company who spoke during the convention were R. J. Firestone, vice-president; J. G. Robertson, treasurer; S. G. Carkhuff, secretary, and A. G. Partridge, general sales manager.

Arrangements were in charge of F. B. Dodge, branch organization manager, and the well-planned social program included a dinner in honor of the visitors at the Portage Country Club, banquets and theater parties; also a minstrel show, staged especially for the convention, and presented by the home office force.

President Firestone has been chosen as chairman of the Akron committee for the Rubber Club banquet to be held in New York City on January 8.

The Firestone Advertising Club has been formed by members of the advertising department and plans have been formulated for bringing to Akron prominent advertising men who will address the members on subjects of particular interest to the advertising fraternity. There are over 30 men in the Firestone advertising department, which numbers over a hundred people in all. Officers of the new club were elected as follows: F. K. Starbird, president; Don Bregenzer, vice-president; H. B. Garske, treasurer, and R. V. Cline, secretary.

* * *

The capital stock of the Punctureless Auto Tire Co., manufacturer of the King Tubeless tire, has been increased from \$100,000 to \$1,000,000. The company's plant is situated on 20 acres of land between Kenmore and Barberton. The main building is 60 by 300 feet and the power plant 36 by 100, two stories high. In the early spring two reinforced concrete and brick buildings 80 by 400 feet, four stories high, will be erected, orders for machinery for these large buildings having already been placed. Edward Hackathorn is president of the company.

* * *

The books of the Goodyear Tire & Rubber Co. show a remarkable record for the past year. Gross business jumped from

\$36,000,000 to \$63,000,000, an increase of 80 per cent over 1915, and net earnings for last year were \$7,000,000 as against \$5,000,000 for the preceding year. The comparative table of the business for the two years is as follows:

| | 1916. | 1915. |
|--------------------------|--------------|--------------|
| Sales | \$63,950,400 | \$36,490,652 |
| Net earnings | 7,003,330 | 5,137,083 |
| Preferred dividend | 764,239 | 469,583 |
| Common dividend | 1,261,332 | 727,248 |
| Stock dividends | 8,427,000 | ..... |

The condensed balance sheet as of October 31 is as follows:

| | 1916. | 1915. |
|---------------------------|--------------|--------------|
| Assets— | | |
| Plant and equipment | \$12,689,056 | \$7,846,207 |
| Quick assets | 30,682,264 | 14,566,858 |
| Other assets | 5,846,474 | 3,866,862 |
| Total | \$49,217,794 | \$26,279,927 |
| Liabilities— | | |
| Capital stock | \$35,000,000 | \$15,027,200 |
| Current liabilities | 9,167,973 | 1,944,600 |
| Reserves | 2,796,654 | 2,276,187 |
| Surplus | 2,253,168 | 7,031,940 |

Total

All the directors were reelected, as follows: F. A. Seiberling, C. W. Seiberling, G. M. Stadelman, F. H. Adams, P. W. Litchfield, H. B. Manton and J. P. Loomis. The directors in turn reelected the officers, as follows: F. A. Seiberling, president; C. W. Seiberling, vice-president; G. M. Stadelman, vice-president and sales manager; P. W. Litchfield, vice-president and factory manager; A. F. Osterloh, secretary; F. H. Adams, treasurer; W. E. Palmer, assistant secretary and assistant treasurer; H. J. Blackburn, second assistant treasurer.

During the present coal shortage the Goodyear company is supplying coal to its employees at cost.

L. C. Rockhill, manager of the auto tire department at the home office of the Goodyear company, and Mrs. Rockhill, with J. S. Willamen, district credit manager, and Frank E. Carroll, manager of the San Francisco branch, are taking a month's trip together in the Hawaiian Islands.

The Faultless Rubber Co., Ashland, Ohio, manufacturer of rubber sundries and specialties, remembered its employees at Christmas time in a unique and substantial manner. Each received a \$500 life and disability insurance policy for the protection of dependent relatives, the amount of which will be increased at the rate of \$100 annually until the maximum of \$1,000 is reached.

E. H. Trader, formerly with the American Express Co., has accepted a position as general salesman with the American Rubber & Tire Co., with headquarters at the Akron office.

The Falls Rubber Co., Cuyahoga Falls, Ohio, has increased its capital stock from \$300,000 to \$500,000.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE rubber industry in the matter of Christmas presents has been vividly illustrated by the Bailey Rubber Co., of this city, whose store, because of extensive and effective advertising in the daily papers, has compared favorably with department stores as regards the number of customers, compared to the area of floor space. C. J. Bailey is a generous advertiser, of long and varied experience, and his advertisements of "Useful Christmas Gifts," giving long lists of raincoats and rubber clothing, footwear, household articles, etc., and especially rubber toys, brought customers to the store by hundreds. Mr. Bailey, when

asked if business had been good with him, modestly replied in the affirmative, but the significant smile he wore spoke louder than words of his satisfactory holiday trade.

Another Boston institution which is doing an extensive business in rubber goods is the United Drug Co., whose chain stores are numbered in the thousands in many sections of the country. The importance of this institution in the rubber trade will be appreciated when it is stated that in six weeks over 75,000 hot water bottles were sold, and that the concern buys them in lots of 300,000 each. This is but one item of the rubber goods line which this company distributes. The latest innovation of the company is interesting. Already an order has been given for over 100,000 inner tubes for automobile tires. When a motorist needs an inner tube, he needs it as the Texan needs a pistol—mighty quick. Some garages stock no inner tubes, or only a limited number of sizes. Not all garage men carry the best makes, and the motorist must buy what he can get. There are now more Rexall stores than garages and the drug company management believes that with its reputation for quality, with its thousands of retail stores, all prominently situated, and nearly all of them open or accessible at all hours, there is a good prospect of selling half a million, or even a million inner tubes this year. These tubes will bear a special trade-marked name, owned by the company.

F. H. Appleton & Son, Inc., manufacturers of reclaimed rubber, have just completed a large addition to their plant at Franklin, Massachusetts. It is a three-story structure, 150 by 50 feet. As soon as this is in operation, the capacity of the plant will be nearly trebled. A new laboratory building has also been added, and equipped with up-to-date apparatus and appliances. As hitherto, Francis H. Appleton, senior, makes his headquarters at the Boston office, 185 Summer street, and Mr. Appleton, junior, will continue in charge of the manufacturing at the Franklin plant.

The Monatiquot Rubber Works Co., at South Braintree, Massachusetts, continues to add to its extensive plant and is breaking ground for the erection of another brick mill building. This is to be two stories high, 190 by 60 feet, and will closely follow in style the lines of the recently erected No. 2 building. To make room for the new addition, it was necessary to move the office building some little distance toward the center of the mill yard, and the journey was safely made without interfering with the office routine.

The new addition to factory No. 3 had a fitting dedication during the early part of December, when a member of the Billy Sunday party held a "shop meeting" there during the noon hour. Not only the company employees attended to a man, but invitations were also extended to the employees of the neighboring factories, and as a result of the enthusiasm shown, the management arranged for a weekly meeting during Mr. Sunday's stay in Boston.

The company's Christmas distribution this year took the form of savings bank accounts which were opened in the names of the individual employees. Each man was awarded an amount proportionate to his length of employment. It was felt that this plan would work out advantageously, and would be the means of inspiring each one to add regularly to his nest egg.

The Elastic Braid & Lace Co., a comparatively new corporation, has secured the factory and business of the A. M. Greenway Co., Chelsea, Massachusetts, and is manufacturing elastic cords, laces and braids for the shoe, corset and suspender trade. George Fickessen, who for several years managed the Greenway business, is treasurer of the company and has charge of the manufacture. Charles M. Porter is president and sales manager. Mr. Porter's office at 179 Summer street was badly damaged

recently by an extensive fire on the street floor of the building, as a consequence of which he has moved the Boston salesroom to 170 Summer street, the main office of the company being at Chelsea.

The A. B. S. Cement & Rubber Co., Inc., notice of whose incorporation appeared in the December issue of THE INDIA RUBBER WORLD, has moved into a new factory at Haverhill, Massachusetts, where it will manufacture rubber cement for the shoe trade and other industries. The officers are as follows: A. B. Alden, president; D. C. Smith, vice-president; M. A. Smith, treasurer; W. E. Bixley and G. H. Bixley, directors.

L. D. Apsley, president of the Apsley Rubber Co., Hudson, Massachusetts, is using his best endeavors to secure good housing for the employees of his company. He recently bought two estates on which he has built 16 houses, and there are now eight more in process of erection. He is also encouraging other operators to build suitable homes both for sale and for rent. It is safe to say that few manufacturing towns have better accommodations for workers than Hudson, and for this Mr. Apsley is to a large extent responsible. The Apsley Rubber Co.'s factory is running to the largest ticket in its history, with a force of about 1,500 hands.

The Dexter Manufacturing Co., 727 Atlantic avenue, Boston, manufacturer of rubber cements, with a factory at South Braintree, Massachusetts, has enlarged the scope of its activities, and is selling rubber soles and heels to the shoe manufacturing trade.

J. Frank Dunbar is president and Griswold Stowe treasurer of the J. Frank Dunbar Co., dealers in crude rubber and allied products. Mr. Dunbar has been prominent in this trade for years, being connected with Geo. A. Alden & Co., of this city. Mr. Stowe was formerly of the Stowe & Woodworth Co., proofer and manufacturer of mechanical goods, Campello, Massachusetts, selling out his interest in that concern to join Mr. Dunbar in forming the new company. The Boston office is at 201 Devonshire street, and the New York office at 71 Beaver street, the latter being in charge of J. Frank Dunbar, Jr.

A serious fire occurred at the plant of the Plymouth Rubber Co., in Canton, Ohio, on the morning of December 15, when the reclaiming department was entirely destroyed by fire, at an estimated loss of \$10,000.

Thomas A. Forsyth, president of the Boston Belting Co., was signally honored late in November in being made an honorary member of the Sigma Delta Sigma fraternity, this being the first instance in over half a century that this fraternity has admitted to its membership any one outside of the dental profession. This was, of course, because of Mr. Forsyth's great benefaction, the Forsyth Dental Infirmary, presented to the City of Boston.

Robert W. S. Cox, formerly New England salesman, and for the last few years sales manager for the insulated wire department of the National India Rubber Co., Bristol, Rhode Island, is now in business on his own account, having recently opened an office at 10 High street, this city. He will deal in insulated wires and cables, confining his trade to large jobbers and central stations. He has an unusually large acquaintance in this line of business throughout the country.

Harry G. Fisk, treasurer of the Fisk Rubber Co., Chicopee Falls, purposes to add to his various other activities by entering the dairy business on a rather extensive scale. He has purchased three adjoining farms in East Longmeadow, Massachusetts, comprising, in the aggregate, 125 acres, the highest and most

sightly land in the town. Next spring he will begin the erection of a handsome summer residence, and later farm buildings. He hopes, in a few years, to be the owner of a valuable herd of cattle.

P. D. Hammond, who will have charge of the new footwear department of the Firestone Tire & Rubber Co., Akron, Ohio, was in Boston early last month. Mr. Hammond was formerly connected with the Diamond Rubber Co., the Goodyear Tire & Rubber Co., and The B. F. Goodrich Co.

M. S. Connelly, formerly of Hoyt's Service and the Greenleaf Co., Boston, has been appointed advertising manager of the Hood Rubber Co., Watertown, Massachusetts.

Charles Bonney has been appointed manager of the factory of the E. H. Clapp Rubber Co., at Hanover, Massachusetts, and Martin Mullin, who has been connected with this concern for more than a quarter century, has been made superintendent.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber plants throughout the state continue to be rushed with work, as they have been during the past year, and there are no evidences of any immediate diminution of the demand. For the first time in many weeks there is practically no trouble brewing among the employees of the different plants. In consequence of the increase in wages that has been put into effect during the past month, labor troubles have entirely disappeared and the managers and superintendents are correspondingly happy. Many of the manufacturers, however, are worried over the continued lack of expert or even competent employees, but this seems to be a situation that cannot be remedied under existing conditions.

Large shipments, many of them abroad, are being made daily from most of the plants, and it seems to be the general belief that the present schedule of work will be maintained for another year at least, this prediction being based upon the amount of orders now on hand or in prospect.

James Morrison, well known throughout New England from his connection with the rubber manufacturing industry in Chicopee, Massachusetts, and Providence, died at his home, 360 Lockwood street, in the latter city, late Monday afternoon, December 18. Early in the month he met with a severe accident at the service station of the Invincible Tire Co., 93 Fountain street, where he was foreman, by which one of the fingers of his left hand was so badly crushed in a pumping machine that it had to be amputated. Blood poisoning developed and resulted in his death. He was in his forty-fifth year.

Mr. Morrison was born in Glasgow, Scotland, in June, 1872, first coming to this country about a quarter of a century ago. With the exception of two or three years while he was in his native country, he had been in America since that time, making his home in Albany, New York, Springfield, Massachusetts, and Providence. He was first connected with The Fisk Rubber Co., as foreman of its factory at Chicopee Falls, Massachusetts. After a few years he moved to Providence to accept the position of inspector at the Revere Rubber Co., but for the past five years he had been in charge, as foreman, of the service station of the Invincible Tire Co. He is survived by his wife and one son. Fraternally, he was prominently identified with Clan Cameron of the Royal Scottish Clans.

Business at the factory of the National India Rubber Co., at Bristol, has been increasing to a great extent during the past few weeks and it is probable that steps will be taken with the commencement of the new year for a still further increase in the output of sporting and outing shoes. It is understood that the present output of 48,000 pairs each working day will be increased

to 55,000, necessitating an increase of employes, who now number upwards of 4,000. There are said to be orders enough on hand at present to keep the factory going for two years.

A number of important changes among the office force at the factory of the National India Rubber Co. have been made during the past month, several resignations making room for promotions in various departments. Arthur H. Emerson, who has been treasurer of the company for several years, has been appointed credit manager and assistant general sales manager of the wire division of the concern, and entered immediately upon the duties of his new position.

Maurice C. Smith, Jr., who has been a clerk in the office for a number of years, has been appointed assistant treasurer and will have full charge of the office and accounting department. Ralph W. Holt, formerly of Hudson, Massachusetts, who has been at the factory for the past two months, has been permanently assigned to take charge of the footwear department, under the management of the order, ticket and shipping departments.

William H. Gardiner has been appointed to succeed James H. Hoar, resigned as overseer of the varnishing and vulcanizing department. Mr. Hoar had been foreman of this department for nearly thirty years. He entered the employ of the National Rubber Co., as it was then called, in the autumn of 1866, working for several years in the varnishing and curing of rubber goods, until he acquired a skilled knowledge of his work. In 1877 he was appointed assistant foreman, Stephen Bourn, a former well-known rubber man, being then in charge of the department. In 1887 Mr. Bourn retired and Mr. Hoar succeeded him.

At the Narragansett Rubber Co. factory, at Bristol, the 700 employes are working full capacity in order to fill all demands and there are orders on hand sufficient to keep the plant in operation to its limit for many months to come. The concern has recently purchased a lot of land with a dwelling house thereon, at the corner of Wood and Catherine streets, which will be used in the expansion of the company's plant, made necessary by the constantly increasing business demands.

Terrence McCarthy, owner of the Narragansett Rubber Co., formerly the Consumers' Rubber Co., who has been confined to his home by a severe attack of the grip during the greater part of the past month, is able to be about again.

A contract for the erection of an addition to the box factory of the Alice Mill of the Woonsocket Rubber Co., at Woonsocket, has been awarded. Two stories will be added to the present building, in which are manufactured boxes used in the shipment of the products of the factory.

John F. McBride, who resigned last April as foreman of the packing department of the Alice Mill, of the Woonsocket Rubber Co., died at his home, 416 Second avenue, Woonsocket, on December 13 after a few weeks' illness of heart trouble. Last March he had an attack of pneumonia and never fully regained his health. He was born in Elderly, Scotland, but coming to this country with his parents, resided at Woonsocket from infancy. He was educated in the parochial school connected with St. Charles church and after leaving school entered the employ of the Woonsocket Rubber Co. He had been foreman of the packing department for more than 17 years when he resigned.

The Rhode Island Tire Co., 109-111 Broadway, Providence, is being conducted by Leonard Hinchcliffe, according to information filed at the office of the city clerk.

James R. Newbold, who for the past five years has been head calender man at the International Rubber Co., at West Barrington, has been promoted to the foremanship of that department.

Richard Unsworth, the old-time watchman at the Revere Rubber Works, on Valley street, Providence, had a narrow escape

recently from being killed on one of the elevators at the company's plant. He was confined to the Rhode Island Hospital several days.

William Howe has been made superintendent of the night forces at the Revere Rubber Co., and Charles Donovan, who had held that position for a number of years, has been promoted to the day service.

The creditors of George H. Decker, who conducted a retail rubber goods store under the style of The Decker Rubber Co., at 76 Weybosset street, Providence, held a meeting in bankruptcy recently at the office of the referee, Nathan W. Littlefield, and appointed Rhodes U. Eldred as trustee. The business has been disposed of by the trustee, who is now adjudicating the estate. The business is being continued by the Arcade Rubber Co. at the same address.

Frank S. Bowker, of Worcester, Massachusetts, has been appointed assistant superintendent at the American Wringer Co. plant, at Woonsocket, to fill the vacancy occasioned by the promotion of Jesse P. Walsh to the superintendency on the death of Michael M. Flynn, who had been superintendent for more than a quarter of a century. Mr. Bowker was connected with the Scotia Worsted Co., of Woonsocket, a number of years ago, but of late has been employed as supervisor at the Du Pont Powder Works, in New Jersey.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

SHORTAGE of soft coal has become a serious factor in Trenton. Many of the rubber manufacturers have been hard pressed for fuel on more than one occasion, but they have managed to keep steam up and the wheels moving. The local trolley line was unable to operate its cars for a short time last week because of inability to get coal.

A compressed air tank in the plant of the Joseph Stokes Rubber Co. exploded recently. Damage to the extent of about \$200 resulted. No one was seriously hurt, although several employes were in grave danger.

The John A. Roebling's Sons Co. has purchased 3,000 tons of structural steel for building operations it proposes starting in the spring. A considerable part of the steel, it is said, will be used in erecting an insulated wire mill.

The Delion Tire & Rubber Co. recently entertained its employes at a formal dinner in Geartner's. George H. Graham, Jr., secretary of the company, was toastmaster. H. H. Coleman, president of the company, was among the speakers.

Employes of the Empire Rubber & Tire Co. gave a generous contribution toward a fund to provide Christmas toys for the poor children of Trenton.

Trenton's first electrical show, recently brought to a close in the Masonic Temple, was a big success and largely attended. Insulated wire makers and other firms making rubber specialties for electrical goods participated.

Included in the number were the Thermoid Rubber Co., Joseph Stokes Rubber Co., Hamilton Rubber Co., U. & G. Rubber Manufacturing Co., John A. Roebling's Sons Co., and Home Rubber Co.

When the newly furnished State Museum is opened in the Capitol there will be an exhibit showing the method of making an automobile tire and the machinery employed in the operation.

The India Rubber Trade in Great Britain.

By a Special Correspondent.

AT the moment the trade is busy on all kinds of waterproof goods, not only for use at home, but also for the soldiers on the Continent. The wet season has caused a great demand for trench capes, waders, trench coats, trench boots, ground sheets, cap covers, cycle capes, scouts' suits, cyclists' overalls, motor hood cloths, and there continues to be a steady demand for gun breech covers, gas mask goods, respirator tubes, tires and numerous other articles for military use. Practically every rubber house in the Kingdom must be working on at least one class of government orders. In some quarters difficulty is being experienced in meeting the heavy requirements but, generally speaking, good deliveries are being made against existing contracts.

LEATHER BOOTS PREFERRED FOR THE ARMY.

Rubber boots are proving unsatisfactory at the front. British soldiers who have had three pairs report that all have been destroyed by barbed wire. Good leather boots are necessary. Some of the Canadian troops have high-legged boots with buckles up to the legs which are giving good service.

RUBBER PRICES.

Rubber companies are issuing new price-lists which show an advance. General mechanical rubber goods show an increase of 10 per cent from November 6, 1916, making the total advance since April, 1915, about 30 per cent. Hose, rubber belting and packing have advanced 15 per cent from the last previous price-lists, making for these articles a total advance of 35 per cent. Tire prices are substantially unaffected. It is generally understood that all fabrics for the rubber trade will now have to be quoted from 12½ to 25 per cent up, according to the class of yarns from which they are manufactured.

British manufacturers are steadily building up a trade in many lines of goods formerly manufactured in Germany and they would probably be doing much more than they are in this direction were their facilities not so heavily taxed with government orders and scarcity of male labor.

Our manufacturers do not have to look for business just now, it comes to them, and here is where their troubles begin. Once the business is obtained, first comes trouble in securing materials to execute the orders, and then comes difficulty in getting out the goods owing to the government demands for men all over the country.

NEW USES FOR RUBBER.

Hardly a day passes without bringing a demand for some use of rubber previously unheard of, and this is generally in connection with the war. For example, orders were recently placed with manufacturers for bags and coverings for listening posts. These bags and coverings are to be used for protecting very delicate instruments used in detecting movements of the enemy below, above and on the surface of the earth. It seems to be reasonable to affirm that no other commodity is so rapidly extending the range of its usefulness as rubber is, and, no doubt, many of the new uses of rubber the war has developed will continue in peace time.

HOT WATER BOTTLES.

The demand for rubber hot water bottles is large and buyers for concerns trading in this class of goods are receiving many offers from American and Canadian manufacturers who are generally to be represented by people unknown to the trade here and apparently unfamiliar with the rubber business.

The trade does not consider the American and Canadian-made bottles as durable as those of British manufacture. It is hard to say whether or not there is any serious basis for this belief, but it is certain that there is a feature in American-made bottles

which our manufacturers could well afford to imitate. This is a projecting semi-circular flap extending about half an inch from the bottom of the bottle and perforated. The great advantage to be seen in this is that it facilitates hanging upside down for complete drying, an improvement that is sure to be much appreciated by the user.

RULINGS ON IMPORT RESTRICTIONS.

In connection with the restrictions on the importation of certain goods, the following rulings have been made:

PROHIBITED.

Cotton bias bindings for use on rubber and canvas shoes.
Elastic of rubber and cotton, if cotton exceeds 50 per cent of the total weight.
Garlock packing.
Rubber-faced cotton fabric.
Bicycle-tire valves.
Canvas, solution coated, used in the manufacture of boots and shoes.
Fabrikoid.
"Omo" sheeting [cotton fabric coated with waterproof solution].

IMPORT ALLOWED BY GENERAL LICENSE.

Balls, tennis.
Cotton duck for belting weighing 11 ounces and upwards per square yard.
Goods consisting wholly or mainly of rubber.
Rubber-covered rollers for clothes wringers.

NOT PROHIBITED.

Bakelite heads for umbrella handles.
Ebonite fork separators for use in connection with electric train lighting.
Elastic of rubber and silk.
Elastic surgical trusses.
Gummed cloth tape.
Hard ebonite tubes for use in connection with electric insulating.
Hose, garden hose, mainly of rubber.
Inner-tubes for motor cars.
Paragon tape for insulating joints in electric wires and cables.

ADVERTISING CONTINUES.

Despite the fact that the private use of motors has been greatly curtailed by various government orders, advertising for both automobiles and tires continues in our papers.

The North British Rubber Co., Limited, and the Dunlop Rubber Co., Limited, are both conspicuous advertisers; the latter is especially in evidence both in newspapers and magazines. Most of the tire advertising very naturally emphasizes good records made by the various tires under the exceptionally rigorous conditions of war service.

American tire manufacturers such as The B. F. Goodrich Co., the Goodyear Tire & Rubber Co., and the Firestone Tire & Rubber Co., are also remarkably active in advertising their wares.

The Michelin Tyre Co., Limited, has been running a very interesting advertisement in "The Times" entitled, "Endurance Will Gain the Victory," and illustrating four ways in which Michelin is participating in the war: (1) aeroplane and army tires; (2) 3,000 employees under the colors; (3) the Michelin hospital; (4) the Michelin shell factory.

A very human trait is exhibited in nearly all motor and tire advertising, and that is the desire on the part of the advertiser to let the public know how much he is doing for his country.

The tire agencies exhibit placards in their front windows telling how many of their men are at the front. In all the advertising of British concerns the "Buy from a British Maker" sentiment is played hard for getting business now and after the war.

WITH RUBBER TIRES ONLY.

The fact that a British manufacturer of steam wagons has placed on the market a 6-ton steam vehicle designed exclusively for use on rubber tires is notable. Steam lorries have been in use in England for many years, and it has been the custom to build them with steel tires, or with tires made up of wooden plugs. Of late solid rubber tires have been made optional and many users have found economy in the increased speed possibility and the protection from the wear and tear of excessive road vibration afforded by resilient rubber tires, but the new Atkinson 6-ton steamer is the first of its kind to be offered for sale with anything but rubber tires.

HOLLAND SHORT OF TIRES.

Tires are greatly needed in Holland, according to C. A. Geerkens, of H. Englebert & Co., The Hague, automobile dealers. American motor cars find a ready sale there, but are invariably shipped without tires, as no rubber goods are now allowed to pass the Allied blockade into neutral European countries whence they might find their way into Germany. Meanwhile, used tires are accorded that solicitous care which a faithful servant deserves.

PRIVATE SHIPMENTS TO RUSSIA RESTRICTED.

The Commercial Attaché of the Imperial Russian Embassy wishes to bring to the attention of American shippers interested in forwarding goods—including rubber articles—to Russia, via Vladivostok, the fact that the importation of private shipments is temporarily forbidden except under special permit. The existing regulations governing the importation of goods via Archangel apply at present to Vladivostok. It is necessary to make application for each individual shipment through the Russian consignee, to the Imperial Department of Commerce, Petrograd.

EXPORT OF RUBBER SOLUTIONS RESTRICTED.

The exportation from Great Britain of rubber solutions containing coal-tar products and derivatives is now prohibited to all destinations, except under license, which will not be granted if a solution contains any considerable percentage of benzol.

Manufacturers have been instructed to get in touch with the Department of Explosives Supplies, Ministry of Munitions of War, in order to ascertain the nature of the substitute for benzol, which in future should be employed in the manufacture of rubber solutions.

RUBBER EYES.

Two French inventors, Drs. Lemaitre and Teuillères, have devised a system for making an artificial eye that can hardly be distinguished from a real one. They aimed at producing a substance of sufficient elasticity and softness to respond to the changes in the eye socket, and at the same time of sufficient hardness to present a smooth, natural effect between the eyelids. Rubber made it possible for them to produce an artificial eye that is said to be comfortable to wear and that moves almost as naturally as its mate.

The first step is to take an accurate cast of the eye socket in plaster of Paris, which the mucous membrane lining the orbit stands very well. From this cast a mold is made, and this is filled with rubber. The difficulty of consistency is solved by making the front of the new eye of hard rubber, vulcanized and enameled to represent the natural appearance, and the back of the eye of soft rubber, hollowed out in the form of a ball, and filled with air.

This artificial eye is thus perfectly elastic, pneumatic, and fits easily the irregularities of the eye socket, responding in a remarkable manner to the ocular movements. It does not irritate the orbit and is not easily broken.

OSTROMYSLENSKI AND HIS SYNTHETIC RUBBER.

"**L**E Caoutchouc & la Gutta-Percha," of November, 1916, announces that it has received from an illustrious collaborator, Dr. Yvan Kondakow, the following communication concerning the synthesis of rubber presented by Ostromyslenski, a translation of which was published in THE INDIA RUBBER WORLD of November 1, 1916.

The synthesis of rubber for special purposes, which has made so much noise, not only in Russia, but also in our friend country, France, presents nothing unforeseen nor remarkable.

Ostromyslenski only isolated a more handy way than the usual methods to obtain, so he affirms, butadiene by the action of acetic aldehyde on ethylitic alcohol in the presence of a catalyzer, such as alumine, at a temperature of 450 degrees C. The butadiene obtained is then purified by known methods and transformed into rubber by heat, in the presence or out of the presence of sodium.

What the value of this method of preparation is; what its cost of production commercially, no one in Russia knows. Despite the enormous expenditures made in his factories, Ostromyslenski has not yet attained any practical result.

One must admit that Ostromyslenski works and above all publishes much work, but his studies are not of a very serious character, for the author is not well acquainted with rubber literature and has a marked tendency to attribute to himself as his own discoveries, things that have been known for a long time.

DR. YVAN KONDAKOW.

THE SITUATION IN FRANCE.

By Our Regular Correspondent.

BUSINESS in rubber goods continues to be brisk, both for the government and private orders, and most manufacturers have now overcome the handicap of labor shortage which was very serious at the beginning of the war, especially for small concerns that had no government orders and could not, therefore, obtain special exemption for their skilled employees.

RAW MATERIALS.

The supply of raw materials, both rubber and compounding ingredients, is satisfactory. Considering the scarcity and the high cost of ocean freight, also the tremendous demand for rubber goods, rubber prices are comparatively low, but chemicals continue to be very expensive.

TIRES.

The chief demand is for pneumatic and solid rubber tires for motor vehicles, but manufacturers of proofed clothing materials, rubber footwear, insulated wire and cable are also doing a lively business.

Considering conditions, the demand for tires for private use is exceedingly good and manufacturers are able to take care of all requirements. Foreign tires have been imported, but these have practically all been for American vehicles requiring sizes not made in France.

The scarcity of leather that has resulted from the war has led our tire manufacturers to discard the studded-leather casings that formerly were so popular here. They have substituted the metal-rubber principle in which the studs are directly anchored in the rubber and fabric of the tire. This is a reversion to an early type of metal-stud tire which in the past was not satisfactory, but is now giving very good service thanks to improved methods of manufacture.

FUTURE SOLID-TIRE TRADE ASSURED.

Our soldiers of to-day will go back to business after the war with the knowledge that motor trucks are far superior to horse-

drawn vehicles for most purposes. As a consequence, the demand for solid rubber tires will be far greater after the war than it was previous to it, and our manufacturers will continue to



A SUPPLY COLUMN IN FRANCE—ALL ON RUBBER TIRES.

have good use for the modern machinery they have installed to take care of war orders.

THE CABLE INDUSTRY.

The shortage and the high cost of coal has been no small source of trouble to all manufacturers in France. Among the measures taken to minimize the ill effects of coal scarcity the most important is the active development of water power—white coal, as we call it. This development is resulting in unprecedented demands for insulated wire and cables; demands that are sure to continue and to grow after the reestablishment of peace. The prospects of our electrical industry are, therefore, very bright. Not only will insulated wire and cables have to be supplied for the total reconstruction and reequipment of the districts now in the enemy's hands, and which are among the richest industrially of the world, but there will be a demand for the development of new electrical power throughout the country.

In districts where water power is unavailable, the gas from coke ovens will be used to drive motors, which in turn will drive dynamos to produce electric current for all purposes.

THE BRUSH INDUSTRY.

Our brush industry has been unfavorably affected by the war. The bristles, which came mainly from Russia, Roumania and Leipzig, have been difficult to obtain, and the markets for the manufactured goods have been curtailed on account of the war and prohibitive prices.

Brush manufacturers here are looking to improved machinery to compensate for the scarcity of labor which will hardly be lessened by the ending of the war. They have also recognized the advantages of setting brush bristles in rubber, and there certainly is an excellent market here for American-made brushes.

RUBBER TUBES SAVE WOUNDED SOLDIERS.

A system of sterilizing wounds, which has been successfully applied in many hospitals here, employs rubber tubes provided with numerous holes through which antiseptic liquids pass to wash out deeply infected wounds. This method of irrigating wounds has reduced amputations by 50 per cent.

THE USE OF PONCHOS.

The square rubber garment, known as a poncho, and long the raincoat of the enlisted man of the United States army, has found equal favor among our soldiers in the trenches. Ponchos are not furnished by our government as part of the regular equipment, but great numbers of them have been supplied by the American LaFayette Fund Society. They are giving full satisfaction and it is not unlikely that they will be officially adopted.

THE RUBBER INDUSTRY IN SPAIN.

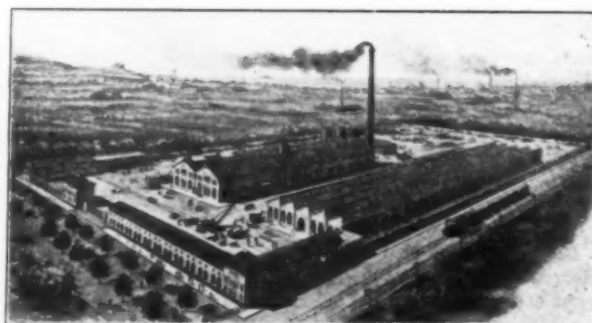
By a Special Correspondent.

THE paralyzation of Spain's commercial and industrial life, that immediately followed the outbreak of the war, has gradually passed, and the prosperity now reigning in Barcelona, our greatest commercial and industrial center, was never paralleled in time of peace. This prosperity is due to numerous orders from belligerent countries and to the fact that our manufacturers have no longer to suffer from foreign competition, which was very bitter before the war.

THE RUBBER INDUSTRY.

Our rubber industry has its full share of the general prosperity. Prior to the war, Spain was not producing more than 50 per cent of her requirements in rubber goods. The balance was imported from France, Germany, Austria-Hungary, Italy, England and the United States, and consisted chiefly in pneumatic tires for automobiles.

Within the past two years our rubber industry has grown so rapidly that it is able now to supply practically all domestic demands and to engage in an export trade which, during the past fiscal year, amounted to more than \$1,000,000. Prior to the war our rubber manufacturers exported a few articles to Latin



BARCELONA FACTORY OF PIRELLI & CO.

America, the Canary Islands and the Near East, but their foreign business had none of the importance it now has.

Our rubber industry is centered in and around Barcelona. There are concerns in other cities, but not large enough to deserve mention here. The following are the most important rubber factories in the Barcelona district:

- J. Anto, Arcjos, Agustin, 7.
- F. Capella, Pelayo, 34.
- M. Estobanell, Boqueria, 32.
- M. Ferrer Marcet, Union, 3.
- P. Garriga Escarpanter, Rbla. Sta. Mónica, 12.
- J. Gassó y Martí, Ancha, 31.
- M. Gishert y Compañía, Paseo Colon, 6.
- Hutchinson, S. A., Rambla Cataluña, 64.
- G. Klein, Princesa, 61.
- Lacelle y Compañía, Universidad, 23.
- S. Llach, S. Pablo, 91.
- Viuda de Mno. Marcet, Pza. Teatro, 6.
- Matas y Compañía, Princesa, 6.
- Maggin Papiol, Pelayo, 58.
- Pirelli & Co., Villanueva y Geltru.
- Ribase Ier, Trafalgar, 5.
- J. Ribera, Puertaferriada, 25.
- J. Rosich, Urgel, 160.
- Luis Ferrer, Fernando, 16.
- Viuda de J. Sabater, Tallers, 6.
- Tusell Hermanos, Fontanella, 20.
- Pablo Fornt, Duquo Tetuan, 25.

VARIETY OF MANUFACTURES.

Spanish manufacturers are producing all kinds of rubber articles including mechanical goods, solid and pneumatic tires, druggists' sundries, toys, toilet articles, insulated wires and cables, cut sheet and molded goods of both hard and soft rubber.

TIRES.

Automobile tires furnish what is probably the largest single item of our rubber trade. Our tire market was formerly supplied by imports from France, Germany, England, Austria-Hungary, Italy and the United States. Now the United States and the domestic industry are getting the bulk of the tire business, though France and England continue to supply small quantities of both solids and pneumatics to their Spanish customers.

CRUDE RUBBER.

Seventy-five per cent of the crude and washed rubber consumed by our rubber factories is purchased in British markets. The balance comes from Portugal, France, Brazil, Colombia, Mexico and Africa. Prior to the war we imported small quantities of crude rubber from Germany and Belgium.

CHEMICALS.

The Spanish chemical industry also is centered around Barcelona. No other branch of our industries felt so keenly the effect of the war at the outset and no other industry has been more benefited by the war.

Prior to August 1914, our rubber manufacturers obtained their chemicals and compounding ingredients from England, Germany and France. Now the domestic industry is supplying much of the demand, but we continue to import such compounding ingredients as golden sulphuret of antimony, zinc oxide, rubber substitute and reclaimed rubber from England, the United States and France.

THE RUBBER TRADE IN JAPAN.

By a Special Correspondent.

IMPORTS OF RUBBER SHOES AND OTHER RUBBER GOODS.

ON account of the war, the Japanese importation of rubber goods from the United States has increased, especially that of rubber shoes and electric tape. A few years ago it was estimated that Great Britain was leading in the exportation of rubber goods to the Orient, but during the last two years Japanese dealers have been supplied almost entirely by the United States. Below are the statistics for 1914 and 1915.

| | 1914. | 1915 (to Mar. 1, 1916). |
|---------------------|---------------|-------------------------|
| Rubber boots | 4,434 pairs | 5,960 pairs |
| Overshoes | 26,811 pairs | 22,943 pairs |
| Electric tape | 23,045 pounds | 42,399 pounds |

The tendency is toward reduced imports this year, as the Japanese manufacturers are doing more skilful work, and are almost equaling American goods in quality.

INCREASED SHIPPING FACILITIES.

The matter of much needed steamship facilities is being solved in a measure by Japan, who has girdled the globe in her bid for foreign trade. She has extended her steamship lines, subsidized by the government, to every great port of call in the world, and is taking steps to retain after the war as much as possible of the great trade she has built up with Russia, China and South America. Russia has recently become Japan's best customer and is buying everything from munitions to boots and shoes. In the month of August alone Japan exported goods to Russia to the value of \$5,343,600. In China she will probably outrival all other countries. For the first nine months of the year her total exports to China were \$60,751,721, an increase of \$16,156,448 over the corresponding period a year ago, and during the last ten days of September reached \$2,446,309. With South

America, too, her trade has nearly doubled, amounting to \$1,036,660 in markets she hardly knew existed previously. Trade with Australia has also been growing amazingly. Japan's largest steamship company, the Nippon Yusen Kaisha, a firm in which the imperial family owns a great part of the stock, has just added two more vessels to its lines to the Antipodes, making a total of 10 Japanese vessels which are now plying between this nation and Australian ports. The Pacific Mail Steamship Co. is also increasing its facilities for trade between America and Japan, and this no doubt will be encouraged still further by the recently inaugurated Marconi trans-Pacific wireless service.

ORGANIZED LABOR MAKING PROGRESS IN JAPAN.

Japanese labor, always an interesting matter to Americans, is responding to the propaganda for western methods. Both male and female workers in Japan are taking up the organized labor movement with vigor, according to Bunji Suzuki, president of the Laborers' Friendly Society of Japan. At the recent convention of the American Federation of Labor he stated that the membership of the society had increased from 10,000 to 30,000 during the last eight months. Japanese laborers on the Pacific Coast, he said, are realizing American ideals and adopting American standards of living, and the influence is gradually affecting conditions in Japan also.

THE TAHAI RUBBER CO.

The Tahai Rubber Co. was organized as a stock company, but the charter members bought up all the stock before it was placed on the market. After purchasing the Kobe Rubber factory, the Standard Rubber factory, and seeking a site for another factory, headquarters were established at Kobe. Thus far activities have been confined to repairs and putting in new machinery. The company will manufacture any sort of rubber goods most needed in the market. The officers are as follows: Busuke Nishizawa, president; Shuhei Osaki, Ryosuke Nishioka, Zeno Tanakamaru, Yeisuke Yamazaki, Shimokuro Yamamoto, directors.

JAPANESE PLANTATIONS IN THE SOUTH SEA ISLANDS.

How Japanese rubber plantations will be affected after the war, it is impossible to foretell. These plantations are practically new, and, on account of the European war, rubber prices have remained so low that there has been little or no profit in them. Some of them, however, paid 15 or 20 per cent on their common stock and, generally speaking, the rubber business has been better than any other. The only difficulty has been that there was some speculation in order to make more profit than is generally expected.

Already the people have acquired a great deal of practical knowledge regarding the rubber business, and they are paving the way to establish well organized plantations. The Japanese Rubber Men's Association has given out the following statistics:

| | |
|-----------------------------|--------------|
| Land owned by Japanese..... | acres 63,511 |
| Cultivated by Japanese..... | 39,886 |
| Planted by Japanese..... | 38,186 |

These figures do not include the holdings of those not members of the association, and for this reason the totals must be much greater. It is estimated that \$15,000,000 has been expended in this section, which has not yet been tapped very much, for the plantations were not started before 1906, and so have not gained sufficient maturity to make it worth while. Probably by next year a great deal of latex can be taken from these new trees, as they will be just ready for the tapping season. For this reason it would be fortunate for Japanese growers if the war should end this year. They would be just in time to help supply the increased demand which peace would bring.

Thus far the Japanese have not lost anything on account of low rubber prices due to the war. While others have been facing difficulties, and changing their plans, our growers have been cultivating and making their new plantations ready for the time when peace will bring increased activity in the rubber

market. The war is sure to be over within three years, and by that time all of the young trees of this section will be producing their full amount of latex, insuring four or five thousand tons of crude rubber annually—enough in itself to supply all of the Japanese manufactories.

NEW PATENTS.

NISHIMURA RUBBER REPRODUCER.

THE Oriental Rubber Co., of Tokio, has secured a patent for this device which is made of common rubber, and is used to reproduce any print in black or color from paper or other material. Papers are laid on a bench and pressed by the reproducer. A little heat is needed for the process, and at the end the papers are washed clean by a chemical solution.

RUBBERIZED WOVEN BELTS.

The Band and Belt Co., of Kobe, have rights in this invention. Twisted threads are woven together and then coated on both sides with a rubber fluid. The belts thus formed are cheap and strong, and give more satisfaction than those made of leather.

AUTOMATIC INK STAMP.

Toichi Watanake, of Tokio, is the inventor of this stamp. No ink has to be used except to keep the machine well filled.

CELLULOID POLISHER.

This is the invention of Teisuke Koyama. It is used to polish anything made of celluloid, and is generally considered better than cloth polishers. If all moisture is excluded in the making, the polisher is very durable.

THE BALATA INDUSTRY IN DUTCH GUIANA.

THE 1916 balata crop has been reaped and prospecting operations for next year's production are in full swing. A fair amount of money has been made this year, and had the European war not closed the most lucrative markets the returns would have been highly satisfactory.

The 1915 crop, however, was fairly good and had conditions been normal the balata industry in Dutch Guiana would now be in a flourishing condition. This statement is borne out by the report of the Balata Co., Surinam, extracts from which follow:

During 1915 the business has presented many difficulties, some of which were hard to face. We do not say these difficulties were connected with the new ordinance, under which for the first time the operations were carried out—in fact, this exploitation took place on too small a scale for the observation of the ordinance to come up to expectations—but the difficulties were the consequence of the belated enactment of the ordinance, so that the granting of concessions by the government also was considerably retarded. The result of this was that a goodly part of the laborers, not being able to afford a long idleness, had to seek other employment elsewhere. When, therefore, the operations were started afresh—some four months later than usual—only a very few men could be obtained.

Weather conditions, with the exception of a too early drought, were favorable, so that operating with only 370 men, a production of 99,608 kilograms [219,596 pounds] was brought in to our stores.

During the year past we could dispose of our balata here, and the stock at Paramaribo was also converted into cash. By these transactions the financial obligations were somewhat ameliorated and a part of the debit balance of advances was neutralized. It is proposed, therefore, to utilize the provisional profit-balance of the year 1915 in addition to the profits on the sales of the products of 1913-14, after deduction of the losses known at the end of those years.

The administration of the Balata Co., Guiana, has been amalgamated with the Balata Co., Surinam, and the exploitation of this concern appears to have given satisfactory results this year. Some delay was experienced, however, the rains not having appeared in the month of April as expected, and for the want of good drinking water, a bowel disorder broke out among the laborers. The last news from our administrator in Surinam

seems to indicate that the production will be satisfactory. Three times as many men are now operating in the bush. There is good reason to believe that the company has passed its worst period and that the future promises well.

According to the profit and loss account, the profits amount to 161,469 florins [\$64,910.54].

The above is but one example; if capital be invested judiciously in balata undertakings and well managed, there is big money to be made, and to the writer's knowledge no well-managed company ever failed. Of course, however, there is a certain amount of risk in all enterprises.

In the Nickerie district a very extensive balata area has just been discovered; it promises to rival any part of the colony so far under exploitation. This district has already enriched a few companies, and there is room for several more.

Up to the end of October reports coming in from the several districts were highly satisfactory; this gives every hope that the 1917 crop will be unprecedented, provided conditions are normal.

EFFECTS OF THE BRITISH BLACKLIST IN BRAZIL.

That Brazilian and Portuguese concerns in Brazil have been benefited by the effects of the British blacklist, is asserted by our South American contemporary, "Wileman's Brazilian Review," which states that, out of 13,751 tons of crude rubber exported from Brazil since the blacklist went into operation, blacklisted firms have shipped only 894 tons, whereas Brazilian and Portuguese concerns have shipped 4,689 tons.

MEXICAN DUTY ON CRUDE RUBBER.

A decree of the Carranza Government, published December 12, 1916, amends article I, section 4 of the revenue law of Mexico and, beginning December 15, 1916, places the export duty on guayule and caucho at \$0.10 per kilogram.

RUBBER TAPPING DURING WINTERING.

The question of the cessation of tapping plantation *Hevea* during the wintering period was brought up at a recent meeting of the Committee of Agricultural Experiments, Kandy, Ceylon. It was pointed out that, according to results obtained from experiments, there was no considerable variation in the amount of starch in the bark and wood from November up to the time of leaf fall in March. When the trees were leafless the amount of starch showed no signs of decreasing. It was deduced from investigations that the period during which plantation *Hevea* should be rested must include the period which extends from the time new leaves start growing to about three weeks after the leaves are fully developed.

Tapping during the wintering period was unprofitable, due to the small yield per tree, but it was not advisable to stop tapping operations, for the cessation of tapping would upset labor forces.

The question ultimately resolved itself as to whether the damage incurred by the trees through tapping in the wintering period was greater than the loss sustained by the disorganization of labor which could not be prevented were tapping operations suspended during the same period. Data on hand was insufficient to decide the question definitely.

RUBBER PLANTATION TRIPLES ITS OUTPUT.

The Brooklands Rubber Co., Limited, owning plantations in Selangor, Federated Malay States, reports profits amounting to £27,725, or \$138,625 for the fiscal year 1915-1916. The directors were able to raise the dividend from 9 to 15 per cent. The cost of production increased, chiefly on account of high freight rates, but the crop increased from 174,050 pounds to 397,007 pounds; 27,000 pounds above the estimate of production announced at the general shareholders' meeting in 1915.

Rubber Planting Notes.

RUBBER CULTIVATION IN SIAM.

HITHERTO most of the crude rubber exported from Siam has been of wild origin, gathered from vines in the jungles of the remote northern districts and carried by pack elephants in Thadua and from there down the Nam-Ta (Vien-Poukha) river to Luang-Prabang in French Indo-China. Some wild rubber also finds its way to Bangkok, capital and chief port of Siam.

With the development of Eastern rubber plantations, and owing to the destructive methods of the native gatherers, the gathering of wild rubber is rapidly on the decline, but Siam is developing rubber cultivation. The first rubber estate in Siam was established about ten years ago by a private syndicate with headquarters in Bangkok. In 1907 the members of this syndicate organized a company registered at Singapore as the Kombok Rubber Co.

The most important rubber plantation in southern Siam, however, is located at Chantaboon and consists of 25,000 trees planted about six years ago, of which 20,000 trees are now ready for tapping. In the Siamese Malay States, also, some attention has been given to rubber cultivation in the districts of Trang and Setul.

It has been impossible to obtain reliable information regarding the output of Siamese rubber plantations. During the last five years the export of crude rubber through the port of Bangkok has been comparatively small. Such shipments are listed by the local customs authorities under the head "Rubber and Rubber Substitutes," the exports under this classification amounting to 142,304 pounds for the fiscal year 1912, value \$18,533; 229,240 pounds for 1913, value \$32,548; 207,025 pounds for 1914, value \$33,431; 125,764 pounds for 1915, value \$15,533, and 187,980 pounds for 1916, value \$11,055.

TAXATION AND BARK RENEWAL.

In an article under this heading our English contemporary, "The India Rubber Journal," states that one good effect must result from the taxes now imposed on the rubber-planting industry. When rubber prices showed a very big profit excessive tapping seemed, in a measure, to be justified, but taxation to-day, however, has become so formidable as to make it inadvisable to continue the policy of tapping to the limit.

AMERICANS IN MALAYA.

The threatened invasion of Malaya by American capital was the subject of a lively discussion at a meeting recently held at Ipoh, Federated Malay States, by the Central Perak Planters' Association. The chairman, Mr. Ferguson, strongly opposed the advent of Americans, and others spoke in the same strain; but there was divergence of opinion as to what action could be taken. One member supported the influx of American capital. Finally it was resolved that "this association is not in favor of large areas being alienated under existing circumstances."

SINGAPORE CRUDE RUBBER TRADE.

That the exports of crude rubber from Singapore to the United States for the first nine months of 1916 were nearly twice as great as the combined exports of the same commodity to Great Britain and Continental Europe, is apparent from a recent report of the American Vice-Consul at that port.

Exports from Singapore to Continental Europe during the first nine months of 1916 decreased in practically all articles except plantation rubber, whereas shipments to Great Britain, in the main, increased. Rubber exports rose in all cases, Europe's

purchases of 3,900 tons during the period in question being 45 times greater than the 1913 figure. Great Britain's increase was from 6,354 tons, in 1913, to 10,914 tons in 1916, and that of the United States from 1,914 tons to 26,913 tons, or about 1,300 per cent.

SOUTH AFRICA PROHIBITS RUBBER EXPORTS.

A recent proclamation of the Government of the Union of South Africa places an embargo on all exports of rubber, gutta percha and balata, crude or manufactured.

NETHERLANDS INDIES RUBBER EXPORTS TO UNITED STATES.

Exports of crude rubber from the Dutch East Indies to the United States during the three months ending September 30, 1916, amounted to 8,745,635 pounds, as compared with 4,631,320 pounds exported during the corresponding period of 1915.

THE SITUATION IN NYASALAND.

The amount of trade and revenue in this British Protectorate during the fiscal year 1916 not only exceeded that of 1915, but showed an increase compared with 1913-14. The crude rubber industry shared in the general prosperity, the exports of plantation rubber alone showing an advance from 33,685 pounds, in 1914-15, to 46,002 pounds in 1915-16.

THE RUBBER INDUSTRY OF THE GOLD COAST.

INTERESTING details respecting the rubber industry in 1915 are given in a report recently issued by the Director of Agriculture of the colony.

HEVEA RUBBER.

During the year the government's agricultural stations distributed 349,450 *Hevea* seeds and 53,305 *Hevea* plants which had been raised in their nurseries; 238 per cent more plants were distributed in 1915 than during the previous year and nearly one-third of them was distributed in the Peki district.

The agricultural stations did not distribute all the *Hevea* seeds produced on their plantations, however, and the undistributed seeds were decorticated and pressed for oil extraction. Exports of crude rubber showed a decrease, the amount being 647,982 pounds against 654,133 pounds in 1914.

TAPPING, SPACING AND OTHER EXPERIMENTS.

Tapping experiments conducted at the various agricultural stations proved the half-herring bone system to be the most economical method of tapping; also that better yields were obtained where the lateral cuts were made on the left-hand side of the tapping channel. Experiments were also conducted to determine the effect of tree spacing upon yield per tapping. These showed that a much higher average yield per tree per tapping is obtained in plots planted 15 by 15 feet as compared with plots where trees of the same age are planted 12 by 12 feet. In the former case the average yield per tree was 44 ounces at each tapping, while in the latter the yield was only 24 ounces. Yields per acre for the two systems of spacing, based on the assumption that each tree was yielding the above average, gave the approximate ratio of 8.7 in favor of the more widely planted trees. *Funtumia* trees previously tapped are annually decreasing in yield, and the cultivation of these trees is being abandoned. Root parasites presented the most serious diseases affecting *Hevea*. Fungoid diseases, though troublesome, in most cases responded to treatment.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED NOVEMBER 14, 1916.

- N**O. 1,204,578. Golf ball marker. J. D. Lyon, assignor to The Fulname Co.—both of Cincinnati, Ohio.
- 1,204,621. Tool for expanding and contracting tire rims. J. Waldschmidt, Fond du Lac, Wis.
- 1,204,636. Rotating heel of flexible rubber. W. G. Anderson, Boston, Mass.
- 1,204,650. Hose coupling. C. A. Claffin, Medford, Mass.
- 1,204,658. Wheel comprising a removable tire rim. H. C. Gibson, New York City.
- 1,204,863. Anti-skid device. E. F. Hafner and J. T. Roberts, St. Louis, Mo.
- 1,204,887. Rubber traction device for pneumatic tires. C. E. La Fleur, Philadelphia, Pa.
- 1,204,921. Life preserving suit. Silas D. Willis, Fort Payne, Ala.
- 1,204,957. Toy rebounder comprising elastic cord. I. R. Dean, Memphis, Tenn.
- 1,205,004. Fountain pen. T. Matsui, Wenatchee, Wash.
- 1,205,021. Anti-skid device. S. Renner and G. P. Adams, Western, Nebr.

ISSUED NOVEMBER 21, 1916.

- 1,205,161. Tire rim. H. M. Chaney, Sardinia, Ohio.
- 1,205,215. Overshoe with an opening at the heel and a surrounding elastic sleeve. F. E. Jousset, New York City.
- 1,205,345. Method of producing reinforced, flat vulcanized articles. A. L. Hatfield, Hillside, N. J.
- 1,205,410. Injection apparatus comprising rubber tubing. A. C. Tenney, Chicago, Ill.
- 1,205,527. Rim for vehicle wheels. C. W. Gressle, assignor to The Standard Welding Co.—both of Cleveland, Ohio.
- 1,205,528. Tire supporting rim for vehicle wheels. T. W. Guthrie, assignor to The Standard Welding Co.—both of Cleveland, Ohio.
- 1,205,657. Securing resilient tires to vehicle wheels. O. A. Parker, New York City.
- 1,205,699. Dress shield. C. D. Bennett, Cresskill, N. J.
- 1,205,752. Non-skid chain. J. Kirkwood, Lenox, Mass.
- 1,205,847. Fountain pen. C. W. Roman, Brooklyn, N. Y., assignor to Eagle Pencil Co., New York City.
- 1,205,849. Tire valve. J. A. Bowden, Los Angeles, Calif., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
- 1,205,866. Demountable rim. O. E. Dingley, West Farmington, Me.
- 1,205,903. Wheel rim. R. M. Keating, Springfield, Mass.

ISSUED NOVEMBER 28, 1916.

- 1,205,958. Demountable tire rim. G. C. Allison, Canton, Ohio.
- 1,205,962. Sponge rubber toe straightener. J. W. Arrowsmith, assignor to The Arrowsmith Manufacturing Co., Inc.—both of Morristown, N. J.
- 1,205,984. Suction and discharge hose. T. A. Forsyth, assignor to Boston Belting Co.—both of Boston, Mass.
- 1,205,987. Rubber cap attachment for rubber hose. C. E. Girten and A. M. Bowman, Houston, Tex.
- 1,205,990. Sweat band including an elastic band. L. B. Heady, Houston, Tex.
- 1,205,995. Tire comprising an outer casing and a plurality of inner metallic rings. E. F. Howard, Ansonia, Ohio.
- 1,206,041. Protective covering for ice-bags. A. L. Saltaper, Houston, Tex.
- 1,206,047. Bathing cap and method of making same. A. C. Squires, Keyport, N. J., assignor of one-half to D. Basch, New York City.
- 1,206,064. Tire tool. M. Waters, New Albany, Ind.
- 1,206,070. Elastic trouser belt. J. S. Woldgemuth, Pittsburgh, Pa.
- 1,206,102. Rubber glove having flutes along the backs of the fingers. J. C. Gibson, Akron, Ohio.
- 1,206,230. Rubber hose. W. W. Kincaid, Meadville, Pa.
- 1,206,306. Packing comprising a rubber core. I. Crane, assignor to Crane Packing Co.—both of Chicago, Ill., a partnership consisting of F. E. Payne and J. Crane.
- 1,206,346. Rubber tread for footwear. A. McTernan, Andover, Mass.
- 1,206,386. Inner tube for pneumatic tires. R. C. Spratling, Opelika, Ala.
- 1,206,519. Elastic support for flat feet. A. Dusterwald, Halle-on-the-Saale, Germany.
- 1,206,522. Demountable rim. L. G. Fleming, Tarrytown, N. Y.
- 1,206,548. Bathing shoe with waterproof out-sole. J. Kimmel, New York City.
- 1,206,624. Pneumatic horse collar. L. E. Van Treese, Letts, Ind.
- 1,206,630. Tire armor. J. W. Whitsett, Berkeley, Calif.
- 1,206,727. Pistol comprising a compressible ball adapted to contain and expel a liquid. R. Parker, New York City, assignor to Parker, Stearns & Co., Brooklyn, N. Y.
- 1,206,749. Turn shoe sole. C. C. Burnham, assignor to the B & R Rubber Co.—both of North Brookfield, Mass.
- 1,206,750. Method of making turn shoes. C. C. Burnham, assignor to the B & R Rubber Co.—both of North Brookfield, Mass.
- 1,206,756. Automobile wheel rim. F. F. Enter, Cuyahoga Falls, Ohio.

Chemical Patents will be found on page 197.

ISSUED DECEMBER 5, 1916.

- 1,206,857. Interchangeable rim clamp. J. Kelsey, Detroit, Mich.
- 1,206,867. Educational toy balloon. J. Lewis, Brooklyn, N. Y.
- 1,206,909. Rubber block tire. F. B. Pfeiffer, Akron, Ohio.
- 1,206,932. Cylindrical rubber block tire. C. A. Simmons, Albany, N. Y.
- 1,206,948. Pneumatic tire. G. B. Van Wagenen, Alstead Center, N. H.
- 1,206,976. Elastic finger support for writing instruments. J. F. Barth, Cleveland, Ohio.
- 1,206,983. Separator for storage batteries. W. L. Bliss, assignor to U. S. Light & Heat Corporation—both of Niagara Falls, N. Y.
- 1,206,990. Resilient tire for vehicle wheels. C. C. Collins, South Lebanon, Ohio, assignor to The Superior Tire & Rubber Co., Augusta, Me.
- 1,207,120. Nipple and comforter for infants. H. H. Younker, New York City.
- 1,207,121. Reservoir shaving brush. F. W. Zeidler, Jersey City, N. J.
- 1,207,185. Spring tire with rubber tread. F. Lotter, Elkton, Mich.
- 1,207,277. Rim for pneumatic tires. W. E. Copithorn, Natick, Mass.
- 1,207,287. Storage battery comprising a rubber jar. B. Ford, Philadelphia, Pa.
- 1,207,317. Fountain pen casing. F. W. Olive, assignor to J. Lipic—both of St. Louis, Mo.
- 1,207,377. Cover for nursing bottle. W. M. Decker, Buffalo, N. Y.
- 1,207,408. Dust cap for air valves for auto tires. A. J. Ingersoll, Bridgeton, N. J.
- 1,207,427. Pump for pneumatic tires, comprising a block of resilient material interposed between the inner tube and its casing. H. F. Molkenbur, St. Paul, Minn.
- 1,207,440. Automobile cap comprising an elastic band. F. Raudnitz, New York City.
- 1,207,594. Pneumatic tire protector. E. E. Miller, Lewisburg, Pa.

ISSUED DECEMBER 12, 1916.

- 1,207,813. Method for preserving tennis balls or other objects containing fluid under pressure. F. W. Stockton, Chicago, Ill.
- 1,207,814. Method for preserving tennis balls or other objects containing fluid under pressure. F. W. Stockton, Chicago, Ill.
- 1,207,852. Confectionery mold comprising compressible elastic material. R. C. Burger, Toronto, Ontario, Canada.
- 1,207,882. Tire valve. C. J. Dorff, Chicago, Ill.
- 1,207,894. Self-sustaining resilient liner for wheel tires. C. F. Geyer, Akron, Ohio.
- 1,207,927. Wheel rim. R. M. Keating, Springfield, Mass.
- 1,207,975. Rim construction. H. Mills, Philadelphia, Pa.
- 1,208,006. Life raft comprising a flexible inflatable mattress. J. Rembieszewski and E. Grodzki, Worcester, Mass.
- 1,208,064. Cleaning device having a friction face of unvulcanized crepe rubber. L. J. Wilber, Brockton, Mass.
- 1,208,122. Rim for automobile wheels. L. G. Fleming, Tarrytown, N. Y.
- 1,208,139. Apparatus for improving the contour and condition of the chin and throat. F. N. Graham, New York City.
- 1,208,149. Detachable sand-tread for tires. W. G. Haning, Riverside, Calif.
- 1,208,158. Game device employing elastic cord. C. S. Hill, Belmont, Mass.
- 1,208,198. Bathing suit having an inflatable lining. S. Penksa, Glen White, W. Va.
- 1,208,209. Laminated leather and rubber fabric for shoe soles and the like. J. D. Prince, Boston, Mass.
- 1,208,222. Demountable rim construction. R. W. Skillin, Oak Park, Ill.
- 1,208,232. Inflatable bag safety device for swimmers and like uses. F. W. Taylor, Cicero, Ill.
- 1,208,605. Packing. C. I. E. Mastin, Midland Park, N. J., assignor to S. Dickson, New York City.
- 1,208,615. Dipped rubber hot water bottle and method of making. H. F. Mittel, assignor of one-half to W. M. Rose, Hyde Park—both of Boston, Mass.
- 1,208,653. Fountain pen. K. Ruchle, Hennef, and A. Koehler, Kolmar, assignors to Firm Klio-Werk, Fabrik für Gebrauchsgegenstände, G. M. B. H., Hennef—both in Germany.

REISSUES.

- 14,231. Watch holding and attaching rubber device. S. G. Lewis, Greensburg, assignor of one-half to G. W. Daum, Jeannette—both in Pennsylvania.
- 14,232. Elastic support for time pieces. S. G. Lewis, Greensburg, assignor of one-half to G. W. Daum, Jeannette—both in Pennsylvania.

THE DOMINION OF CANADA.

ISSUED SEPTEMBER 30, 1916.

- 171,751. Rubber cover for tooth brushes. T. R. Plank, Los Angeles, Calif.
- 171,780. Collapsible pail. The Gutta Percha & Rubber Limited, assignee of W. Seward—both of Toronto, Ontario, Canada.
- 171,805. Eraser. E. M. O'Herron, Pittsburgh, Pa., assignee of J. A. Coyle, Baltimore, Md.
- 171,821. Rubber impregnated storage battery separator. T. A. Willard, Cleveland, Ohio.

Machinery and Process Patents on pages 200-202.

- 171,823. Case for nursing bottle. L. C. Butler, New York City.
 171,851. Teat cup for milking machine. H. R. Jenkins, Eltham, Taranaki, New Zealand.
 171,890. Necktie with rubber lining. W. A. McWatty, Duluth, Minn.
 171,996. A bowling pin the body consisting of hard vulcanized rubber and fibrous material. The Brunswick-Balke-Collender Co., Chicago, Ill., assignee of M. J. Whelan, Muskegon, Mich.
 172,076. Bath mat. E. L. Livingston, West Orange, N. J.
 172,096. Pedal pad. G. H. Rives, New York City.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

In order to give the public the advantage of having abridgements of specifications up to date while retaining their numerical sequence, applications for patents made subsequent to 1915 are given new numbers when their complete specifications are accepted, or become open to public inspection before acceptance. The new numbers start with No. 100,001 (without any indication of date), and supersede the original application numbers in all proceedings after acceptance of the complete specifications.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 8, 1916.]

- 10,363 (1915). Soft rubber suction disk for suction dentures. N. Cohen, Lowland Villa, Wellington street, and F. Bowerman, 216 County Road—both in Swindon.
 10,457 (1915). Non-skid device for twin tires. S. B. D. Morgan, 15 Roland Gardens, South Kensington, London.
 10,481 (1915). Floats for hydro-aeroplanes comprising inflatable air chambers and a pneumatic tire. J. Schweitzer et Cie, Seine, France.
 10,559 (1915). A renewable tread for tire covers. J. Yates, 13 Joseph street, Sutton, St. Helens, Lancashire.
 10,569 (1915). Inflatable pontoon, etc. A. E. Jones, 37 Liddon Terrace, Leeds, Yorkshire.
 10,574 (1915). Vehicle wheel comprising an outer rigid rim carrying a sectional rubber tread. J. Slee, Moss House, Wargrave Old Road, Newton-le-Willows, Lancashire.
 10,593 (1915). Non-skid tread band for wheel tires. M. G. Cervello, Caxton House, Westminster, and R. H. Neal, 8 Fielding Terrace, Ealing Common, London.
 10,657 (1915). Dress shield. T. McKenna, 31 Basinghall street, London.
 10,688 (1915). Disks and washers made of coir yarn fabric impregnated with rubber, balata, etc. G. D. Rose, 14 Albert Park Road, Lower Broughton, Salford, Manchester.
 101,461. Rubber cylinder for hat finishing apparatus. W. E. Turner, Ashton Road, and R. Lowe, 25 Goole street—both in Denton, near Manchester.
 101,465. Rubber stair treads. G. Anderson, and Leyland & Birmingham Rubber Co., 24 Duke street, Aldgate, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 15, 1916.]

- 10,772 (1915). A new typewriter platen roller with rubber sleeve between the core and outer sheath. Underwood Typewriter Co., 30 Vesey street, New York City, and J. J. Cooper, 120 Queen street, London.
 10,773 (1915). Heel with rubber tread. L. Clarke, 207a Brompton Road, London.
 10,880 (1915). Securing loops of fabric or leather to rubber cord. W. P. Dando, 126 Highbury New Park, London.
 11,064 (1915). Doll whose limbs are retained in their sockets by elastic cords. F. Wilkins, 23 Grove Road, Wallasey, Cheshire.
 101,516. Tire tool. C. Goodijn, 16 Nicolaes, Witsenstraat, Amsterdam, Holland.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 22, 1916.]

- 11,070 (1915). Hollow tire with metal embedded reinforcing ring. E. B. Killen, 27 Queen Victoria street, and Commercial Tyre Co., 23 Albert Embankment—both in London.
 11,100 (1915). Tire valves. E. A. Hilding, Lidköping, Sweden.
 11,165 (1915). Rubber tire for casters and rollers. A. B. Williams, Weaman street, Birmingham.
 11,170 (1915). Wheel tire composed of alternate blocks of hard and soft rubber. J. Elias, 96 Regent Road, Salford, Lancashire.
 11,239 (1915). Rubber casing for hand grenade and the like. J. Gray, 9 Albert Drive, Crosshill, Glasgow.
 11,246 (1915). Vaccine syringe with rubber cap. W. H. Furness, National Park, N. J., U. S. A.
 11,299 (1915). Rim attachment for block tires. W. T. G. Ellis, 15 Cambridge street, Glasgow.
 11,306 (1915). Rubber studs for hat finishing apparatus. W. E. Turner, Ashton Road, and R. Lowe, 25 Goole street—both in Denton, near Manchester.
 11,329 (1915). Arch support with elastic band. J. Batten, 63 Ridge Road, Letchworth, Hertfordshire.
 11,339 (1915). Elastic cord device for securing paper to drawing boards. A. P. Wright, and H. E. Wright, 37 Furnival street, Holborn, London.
 11,387 (1915). Rubber toe spreaders. P. G. H. Hinder, Oxford House, Oxford street, London.
 11,388 (1915). Foot arch supports with rubber studs. P. G. H. Hinder, Oxford House, Oxford street, London.
 101,526. Rubber wiper for motor or tram-car windows. M. L. Morton, 1226 Murray Hill avenue, Pittsburgh, Pa., U. S. A.
 101,529. Rubber watch holders. S. G. Lewis, Greensburg, Pa., U. S. A.
 101,536. Rubber coated rollers in machine for making artificial leather, fur, etc. T. Schmid, and J. Foltzer, Horn, Switzerland.

- 101,537. Liquid cored golf ball. St. Mungo Manufacturing Co., 120 Sylvan avenue, Newark, N. J., U. S. A.
 101,560. Rubber blocks mounted in metal shoes secured to a cover of rubberized leather. G. H. G. Oldham, and F. E. Clark, Scotsburn, Toorak Road, Toorak, Victoria, Australia.
 101,561. Rubber tipped toy swords, bayonets, daggers, knives, and spears. R. Kendrick, Empire Works, Darwin street, Birmingham.
 101,570. Pneumatic tire pressure gages. M. C. Schweinert, 226 Palisade avenue, West Hoboken, N. J., U. S. A.
 101,574. Tire carrying rim. J. A. Law, 29 Southampton Buildings, Chancery Lane, London.
 101,587. Crutch with pneumatic rubber tip. G. A. Hipwood, 149 Warren avenue, Boston, Mass., U. S. A.
 101,589. Solid tire. W. B. Estes, 258 Valley Road, West Orange, N. J., U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 28, 1916.]

- 11,482 (1915). Waterproof life-saving garment. T. Matthews, 161 Dwight street, Brooklyn, N. Y., U. S. A.
 11,503 (1915). Detachable emergency tread. M. W. Dadey and E. Selberg, Winslow, Arizona, U. S. A.
 11,504 (1915). Wheel tire comprising an outer cover with a filling of hollow rubber balls and unvulcanized rubber. H. E. Wolken, Leigh, Nebraska, U. S. A.
 11,582 (1915). Spring wheel rubber cushion. T. G. Jelly, 1 Court, 4 House, Charles street, Coventry.
 11,689 (1915). Reservoir pen. J. L. Clarke, 25 Clarendon Square, Leamington Spa, Warwickshire.
 11,722 (1915). Apparatus comprising a rubber cylinder for making phonograph records. T. Eynon, 3708 North Ashland avenue, Chicago, Ill., U. S. A.
 101,624. Elastic block tire. H. Radlovich, 1301 Washington avenue, New York City, U. S. A.
 101,649. Draftsman's rule of hard rubber. A. E. Hegardt, 1536 North 58th street, Philadelphia, Pa., U. S. A.

THE FRENCH REPUBLIC.

PATENTS ISSUED (WITH DATES OF APPLICATION).

- 480,743 (January 22, 1916). Improvements in shock absorbing heels. A. K. Pomeroy.
 480,824 (February 1, 1916). Improvements in tire caliper-gages. The B. F. Goodrich Co.
 480,892 (February 9, 1916). Pump for pneumatic tires and other purposes. H. Parkes.
 480,904 (January 24, 1916). Plastic material susceptible of being used as a substitute for celluloid, leather, etc., and process for its manufacture. S. J. Peachey.
 480,934 (February 11, 1916). Pneumatic tire arrangement. H. W. Van Maesteren, A. Edwards and H. Headley.
 480,967 (December 30, 1915). Elastic wheel without pneumatic tire adaptable to any hub. A. A. A. Darche.
 480,972 (February 16, 1916). Improvements in fire hose, garden hose and others. R. Many.
 480,973 (February 14, 1916). Special pneumatic pillow. L. Malinge.
 480,983 (February 17, 1916). Wheel with a solid or hollow tire having its hub enclosed in an elastic ring. M. F. Kettler.

TRADE-MARKS.

THE UNITED STATES.

- 82,721. The word STORK within a circle of babies' heads—rubber nipples. United Drug Co., Boston, Mass.
 85,838. The word NEVERLEK surrounded by an oval shaped figure, the letters conforming to the shape of the oval—waterproof automobile and carriage fabrics. F. S. Carr Co., Boston, Mass.
 95,042-1/2. The word CHALLENGER—golf balls and golf accessories. J. P. Cochrane, Edinburgh, Scotland.
 96,832. The word FARRAGUT—hose made partly of rubber and partly of cotton. The Manhattan Rubber Manufacturing Co., New York City.
 81,475. An illustration of a high rubber boot having a yellow top band—rubber boots and shoes. United States Rubber Co., New York City.
 81,476. An illustration of a high rubber boot having a violet top band—rubber boots and shoes. United States Rubber Co., New York City.
 81,477. An illustration of a high rubber boot having a blue top band—United States Rubber Co., New York City.
 81,478. An illustration of a high rubber boot having an orange top band—rubber boots and shoes. United States Rubber Co., New York City.
 81,479. An illustration of a high rubber boot having a green top band—rubber boots and shoes. United States Rubber Co., New York City.
 81,480. An illustration of a high rubber boot having a white top band—rubber boots and shoes. United States Rubber Co., New York City.
 85,589. The word HOSSEMOOR—inner tubes for tires, and non-metallic tires and tire casings composed of rubber or rubber and fabric. Racine Auto Tire Co., Racine, Wis.
 85,688. An illustration of a medallion with pendent streamers, both being printed in blue—waterproofed coats, hats, etc. The Buckley-Newhall Co., New York City.
 85,689. The word BLUE RIBBON—waterproofed coats. The Buckley-Newhall Co., New York City.
 95,193. The word AMCO—mechanical rubber goods. Associated Manufacturers Co. of New York, New York City.

- 98,693. The word **UWEAR**—rubber boots and shoes. Goodyear Rubber Co., Middletown, Conn.
- 94,187. A representation of a tire encircling an automobilist's head, above which is the head of an open-mouthed tiger, with the words **ALWAS-HOLD** written across its open mouth—vulcanizable fabric tire repair material. W. U. Cowan, Chicago, Ill.
- 98,015. The word **TIREROID**—composition for healing punctures in pneumatic tires. The Tireoid Co., Chicago, Ill.
- 98,505. The word **SYMBOL**—druggists' rubber goods. United Drug Co., Boston, Mass.
- 94,885. The word **EASYSTRIDE**—shoes made of leather, rubber, etc. Brokaw Brothers, New York City.
- 97,359. A representation of a head with horns and the words **THE DEMON** written thereon—tennis-balls, cricket-balls, foot-balls, hockey-balls, bats, and rackets. Slazengers, Limited, London, England.
- 97,450. The words **RELIANCE DE LUXE**—household rubber gloves. The Faultless Rubber Co., Ashland, Ohio.
- 97,457. The word **DAUNTLESS**—raincoats and trousers. Solomon Newman, New York City.
- 97,502. A four-cornered drawing with the word **NORWOOD** across the center—The Cincinnati Rubber Manufacturing Co., Norwood, Ohio.
- 97,503. A four-cornered drawing, at each corner the letter **C. R. M. Co.** and in the center the word **CONGO**—belting, hose, and packing. The Cincinnati Rubber Manufacturing Co., Norwood, Ohio.
- 98,219. The representation of a seascape and the words **THE RISING SUN** and **THE GREAT COLOUR MAKE**—pigments for use in rubber, etc. Orrs Zinc White, Limited, London and Widnes, England.
- 98,525. The words **POLACK**—packing, hose, tubes, solid rubber tires, and pneumatic rubber tires. Polack Tyre & Rubber Co., New York City.
- 98,729. The words **OUR PIPPIN**—suspenders. The Gluckauf Co., Inc., New York City.
- 98,730. The words **OUR DANDY**—suspenders. The Gluckauf Co., Inc., New York City.
- 90,592. The letters **N** and **T** intertwined—rubber boots and shoes. The Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.
- 97,587. The word **SUPPON** written within the letter **S**—rubber pedal covers. Mattson Rubber Co., Lodi, N. J.
- 98,193. A representation of a pneumatic tire, and around the inside of the tire the words **TOURISTS DELIGHT, MILES AND SMILES**—puncture proof solution. J. N. Neal, Coldwater, Mich.
- 98,602. The words **THE HIGHWAY**—automobile tire casings and tire tubes composed of rubber. The National Tire & Rubber Co., East Palestine, Ohio.
- 98,607. The word **PROXITE**—waterproof clothing. New York Mackintosh Clothing Co., New York City.
- 98,704. An illustration of a man holding the globe over his head, on the globe is written the word **SAMPSON**—tennis balls, golf bags, and sporting goods. C. J. O'Reilly, Los Angeles, Calif.

THE DOMINION OF CANADA.

- 21,980. A laughing face surrounded by a tire—rubber tires, inner tubes, valve patches, inner cases and rubber tubing of all descriptions. Lee Tire & Rubber Co., Whitmarsh, Montgomery, Pa.
- 21,993. The word **FAULTLESS** and the representation of a shield bearing the initial **F** and a lily—certain named rubber goods. The Faultless Rubber Co., Ashland, Ohio.

THE UNITED KINGDOM.

- 373,577. The word **KALAD**—insulating preparations (electrical) composed of bitumen and shale oil. Callender's Cable & Construction Co., London, E. C.
- 373,644. A lozenge containing the letters **BHAS**—litharge, lithopone, red and white lead. The Broken Hill Associated Smelters Proprietary, Limited, London, E. C.
- 374,017. The word **FORMITE**—electrical insulating preparations made of materials included in class 50. Damard Lacquer Co., Limited, London, S. W.
- 374,332. The word **SEALAX**—sounding tubes containing rubber. Kelom, Bottomley & Baird, Limited, Glasgow.
- 374,536. The word **HAWK**—golf balls. The North British Rubber Co., Limited, Fountainbridge, Edinburgh.
- 374,537. The word **OSPREY**—Same.
- 375,103. The word **GURSHA**—steam and hydraulic packing. Robert Beldam, Limited, London, E. C.
- 375,104. The word **HINXFOO**—Same.
- 375,105. The word **PANDO**—Same.
- 375,106. The word **ALLIED**—Same.
- 375,158. The word **NIDROC**—knapsacks, tarpaulins, tents, rick cloths, hose (tubular), packing (steam and hydraulic), waterproofing compound for textile garments, goods manufactured from rubber and gutta-percha. George Cording, Limited, London, W.

THE FRENCH REPUBLIC.

- 10,057. A trade mark composed of Chinese letters—for all kinds of rubber goods including wearing apparel. Audinet, Lacroix & Cie., Lyons.
- 16,255. Monogram composed of letters **M. A. L. L. T.** enclosed in a large letter **O**—erasers and fountain pens of soft and hard rubber. M. Mallot, Paris.
- 162,532. The word **TRIFLEX**—hard rubber fountain pen, rubber erasers and other stationery supplies. Société Anonyme des Anciens Etablissements. J. M. Faillard, Paris.
- 162,791. The word **ALERTE**—rubber erasers. Same.
- 162,792. The word **ARCHIMÈDE**—Same.
- 162,793. The word **CADMUS**—Same.
- 162,856. The words **FREE SKATE**—anti-skid devices for vehicle wheels. Paul Henriot, Paris.
- 162,896. Picture of open box showing contents comprising emery sheets, rubber and fabric patches, and a tube of rubber solution—tire repair kit. Victor Katz, Asnières.

- 162,908. The words **LE CACHALOT** and the picture of a cachalot whale, all within a double circle. Rubber-proofed garments. Madame Veuve Piazio, Paris.
- 162,909. The words **LE CACHALOT**—Same.
- 162,953. The word **VELOCÉ**—rubber solution. Pierre Fernand Lespinasse, Paris.
- 162,999. The words **LA DILASOIE**—diluted rubber articles. M. Querville, Vincennes.
- 163,295. The words **LE GORIEUX**—anti-slip shoe-like device for use on crutches and wooden legs. Veuve Gagé Charlet, Paris.
- 163,350. The word **PROTECTAS**—rubber-proofed garments. Adolphe Schmewetsch, Paris.
- 163,356. The word **UNIC**—elastic bands of rubber and fabric. Alphonse De Bruyne, Paris.

NEW ZEALAND.

- 13,314. The word **AVON**—tires of india-rubber. The Avon India Rubber Co., Limited, Melksham, Wiltshire, England.
- 13,462. The word **BOOMERANG**—rubber tires, treads, and inner tubes. Barnett Glass Rubber Co., Limited, 289-294 Swanston street, Melbourne, Victoria, Australia.

DESIGNS.

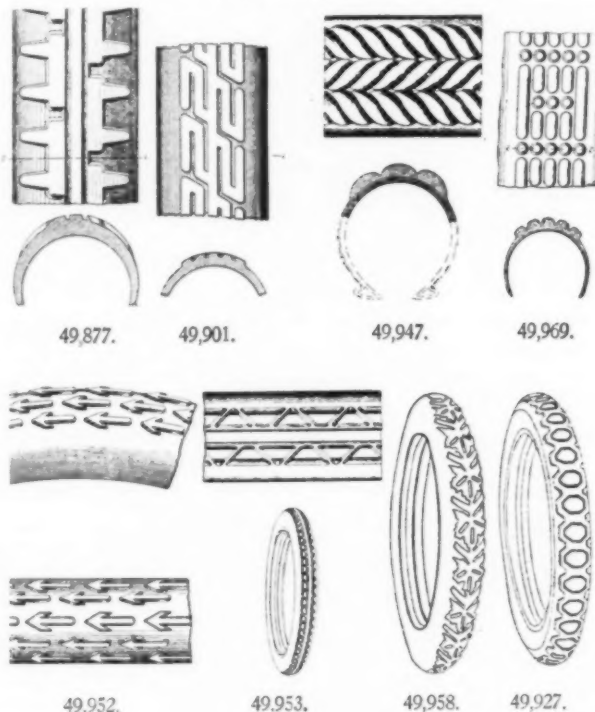
THE UNITED STATES.

- 49,905. Golf ball. Term 7 years. Patented November 14, 1916. P. A. Martin, Birmingham, England.

DESIGNS FOR TIRES.

THE UNITED STATES.

- 49,877. Pneumatic tire tread. Term 14 years. Patented November 14, 1916. P. B. Bosworth, assignor to The Victor Rubber Co.—both of Springfield, Ohio.
- 49,901. Elastic vehicle tire. Term 14 years. Patented November 14, 1916. O. J. Kuhlke, assignor to The Amazon Tire & Rubber Co.—both of Akron, Ohio.
- 49,927. Automobile tire. Term 14 years. Patented November 21, 1916. R. H. Keaton, San Francisco, Calif.



- 49,947. Tire tread. Term 7 years. Patented November 28, 1916. S. J. Bogan, Torrance, Calif.
- 49,952. Tire. Term 14 years. Patented November 28, 1916. G. Crowley, Hartford, Conn.
- 49,953. Tire tread. Term 14 years. Patented November 28, 1916. W. R. Denman, Akron, Ohio.
- 49,958. Tire. Term 3½ years. Patented November 28, 1916. O. W. Dunham and F. W. Willis, Toronto, Ontario, Canada.
- 49,969. Tread band for pneumatic tires. Term 14 years. Patented November 28, 1916. V. A. Parker, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

Review of the Crude Rubber Market.

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NEW YORK.

PLANTATION rubber has been in good demand, particularly during the first two weeks of December, when heavy buying was indulged in by the larger manufacturing interests. Para sorts and Centrals moved freely in sympathy with the buying activity that was evidently in anticipation of the approaching holiday season. Prices had fluctuated considerably in the interim and gains were recorded in the entire list, with plantation leading the list. On December 14, first latex, spot, was 78 cents, an advance of 5 cents since the first of the month, and Upriver fine, spot, was 80 cents, an advance of about one cent since December 1. Africans and Centrals were in good demand and recorded substantial gains in prices. The last two weeks of the month were comparatively quiet, with trading confined to dealers and the usual routine business of small manufacturers. Inquiries were mostly confined to futures, and very little interest was shown in spot quotations. The dullness of the market was seasonable and therefore prices on all descriptions developed an easier tone during the closing week. On December 27, First latex, spot, was 76 cents, and Upriver fine, spot, 79 cents.

The S.S. "Tempaisan Maru" cleared from Seattle, Washington, for Vladivostok on December 17, with 1,111 tons of Brazilian Para rubber. This verifies to some extent the buying for Russian account that was reported in these columns November 1.

LONDON.

The forward movement that featured the December market was confined to plantations, as Paras failed to advance accordingly. The sharp advance in price was followed by heavy forward sales that apparently checked the buying movement. It was generally conceded that the submarine menace influenced the rising market strongly by showing the necessity of providing against possible curtailment of supplies. However, there are ample supplies in sight, which would normally check the advancing market were it not for the imminent shortage of tonnage that will promptly be reflected in the price of crude rubber. London imports for November were 6,118 tons, against 3,835 tons for October. Liverpool imports for November were 1,192 tons, against 1,143 tons for October. The reexports for November were as follows: London, 4,656 tons; Liverpool, 951 tons.

SINGAPORE.

There was a good demand for standard grades at the auction held November 2, Pale crêpe and Ribbed smoked sheet bringing 59 cents and 58.6 cents, respectively. Of 628 tons offered, 452 tons were sold. The following week 770 tons were cataloged, and 454 tons sold in a strong market at advanced prices for the leading grades of about 3 cents a pound. On November 17 a record quantity of 948 tons were cataloged, but only 385 tons were sold, resulting in easier prices. Pale crêpe sold up to 62 cents, and Ribbed smoked sheet realized 59.5 cents. The average price for Plain smoked sheet was 54.8 cents.

The result of the auctions held December 1, 8, 15 and 21 was as follows: Pale crêpe averaged 65.4 cents and Smoked sheet 64.5 cents. The amount sold was 1,350 tons as compared with 1,827 tons a month ago.

BATAVIA.

The demand for spot rubber at the auction September 22 was good and prices advanced. Many holders took advantage of this and sold heavily before the auction. There were 12,835 pounds offered and 11,000 pounds sold. The auction of September 29 brought out 24,543 pounds of which 11,802 pounds were sold at advanced prices.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and December 29, the current date:

| PARA. | Dec. 1, 1915. | Dec. 1, 1916. | Dec. 29, 1916. |
|---------------------------|----------------|----------------|----------------|
| Upriver, fine, new..... | 68 @ | 78 @80 | 78 @ |
| Upriver, fine, old..... | 69 @ | ..... | ..... |
| Islands, fine, new..... | 65 @ | 71 @ | 70 @ |
| Islands, fine, old..... | ..... | ..... | ..... |
| Upriver, coarse, new.... | 58 @ | 50 @ | 53 @ |
| Upriver, coarse, old.... | ..... | ..... | ..... |
| Islands, coarse, new.... | 33 @ | 31 @32 | 34 @ |
| Islands, coarse, old.... | ..... | ..... | ..... |
| Cametá | 35 @ | 32 @33 | 33 @ |
| Caucho, ball, upper.... | 58 @ | 50½ @51 | 54 @ |
| Caucho, ball, lower.... | 56 @ | 47 @49 | 50 @ |
| PLANTATION. | | | |
| First latex | { Spot.. 75 @ | { Spot... 73 @ | 79 @ |
| crêpe..... | { Afloat | { Futures 73 @ | 76 @ |
| Amber crêpe, light..... | { Spot.. 71 @ | { Futures 71 @ | 75 @ |
| ..... | { Futures 71 @ | ..... | 73 @ |
| Brown crêpe, clean..... | { Spot... 68 @ | { Futures 68 @ | 74 @ |
| ..... | { Futures 68 @ | ..... | 69 @70 |
| Smoked sheet, | { Spot.. 75 @ | { Spot... 73 @ | 79 @ |
| ribbed..... | { Afloat | { Futures 73 @ | 76 @ |
| Fine sheets and biscuits, | ..... | ..... | ..... |
| unsmoked ..... | ..... | ..... | ..... |
| CENTRALS. | | | |
| Corinto | 52 @53 | 47½ @ | 51 @ |
| Esmeralda, sausage | 57 @55 | 47 @ | 50 @ |
| Nicaragua, scrap | 53 @55 | 46½ @47 | 48 @ |
| Mexican plantation, sheet | ..... | 49 @50 | 49 @ |
| Mexican, scrap | 53½ @54 | 45 @46 | 48 @ |
| Mexican, slab ..... | ..... | 33 @34 | 34 @ |
| Manicoba ..... | ..... | 45 @ | 35 @36 |
| Mangabeira, sheet | 36 @39 | 40 @ | 36 @ |
| Guayule | 33 @35 | 37 @39 | 42 @44 |
| Balata, sheet | 56 @58 | 74 @ | 75 @ |
| Balata, block | 45 @46 | 65 @65½ | 63 @ |
| AFRICAN. | | | |
| Lopori, ball, prime.... | 65 @ | 62 @63 | ..... |
| Lopori, strip, prime.... | ..... | ..... | ..... |
| Upper Congo, ball, red.. | ..... | ..... | ..... |
| Rio Nunez Niggers..... | 63 @64 | 63 @64 | 62 @ |
| Conakry Niggers | 60 @61 | 58 @60 | 60 @ |
| Massai, red ..... | ..... | 55 @57 | 60 @ |
| Soudan, Niggers ..... | ..... | ..... | ..... |
| Cameroon, ball, soft.... | ..... | ..... | ..... |
| Cameroon, ball, hard... | ..... | ..... | ..... |
| Benguela, No.2, Superior | ..... | 40 @41 | 39 @ |
| Benguela, No. 2..... | 39 @40 | 39 @ | 34 @ |
| Acera, flake | 35 @37 | 23 @ | 30 @ |
| EAST INDIAN. | | | |
| Assam | 50 @54 | 49 @ | ..... |
| Pontianak | 6¼ @7 | 8½ @ | 8½ @ |
| Gutta Siak | 11¼ @12 | 16 @ | 14 @ |
| Gutta red Niger..... | ..... | 27½ @ | 28 @ |
| Borneo III ..... | ..... | ..... | ..... |
| Gutta Percha, red Macassa | 1.85 @2.00 | 1.88 @2.00 | 1.90 @ |

COMPARATIVE NEW YORK PRICES FOR DECEMBER.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"The market for commercial paper has remained fairly steady through December, though with a slight stiffening in rates and some falling off in demand, especially from New York City banks. The best rubber names have continued selling at 4@4½ per cent, and those not so well known 5@5½ per cent."

| | 1916.* | 1915. | 1914. |
|-----------------------|-------------|-------------|-------------|
| Upriver, fine | \$0.78@0.81 | \$0.68@0.87 | \$0.70@0.76 |
| Upriver, coarse | .47 @.56 | .57 @.72 | .51 @.58 |
| Islands, fine | .69 @.72 | .65 @.80 | .59 @.70 |
| Islands, coarse | .30 @.34 | .32 @.45 | .31 @.38 |
| Cametá | .31 @.36 | .35 @.48 | .34 @.41 |

*Figured only to December 26.

MARKET CABLE SERVICE FROM LONDON.

The following market report has been cabled from Aldens' Successors, Limited, London:

| Date. | Standard Crêpe. | Smoked Sheet. | Market. |
|-------------------|--------------------|------------------|--------------------|
| November 27 | 67.52 | 67.52 | There were buyers. |
| December 4 | 71.28 | 71.28 | There were buyers. |
| December 11 | 80.70 | 80.70 | There were buyers. |
| December 18 | 68.82 | 68.82 | There were buyers. |

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by The Waterhouse Co., Limited:

| Date. | Crêpe. Price per lb. | Smoked Sheet. Price per lb. | Pounds Sold. | Market. |
|-------------------|----------------------------|--------------------------------------|-----------------|-------------------------------------|
| December 1 | 66.3 | 63.3 | 1,093,120 | Closed dull with less inquiry. |
| December 8 | 65.8 | 66.3 | 1,312,640 | Good demand for all descriptions. |
| December 15 | 70.1 | 69.2 | 244,160 | Very depressed; prices nominal. |
| December 21 | 59.5 | 59.5 | 374,080 | Flat; there is scarcely any demand. |

SINGAPORE.

GUTHRIE & CO., LIMITED, Singapore, report [November 9, 1916]:

The quantity sold at this week's auction amounted to 450 tons out of 738 tons offered. There was a good demand yesterday, but on the continuation this morning it fell away somewhat and closed quiet. The only grade to show any change from yesterday was fine pale crêpe, one attractive parcel fetching \$147 per picul. Standard sheet sold up to \$145 and at this figure is \$7 higher on the week. Plain smoked sheet and unsmoked sheet were wanted, selling up to \$136 and \$134 respectively. The lower grades show an average increase of \$5 per picul. Scraps were neglected. The following was the course of values:

| | In Singapore per picul.* | Sterling equivalent per pound in London. | Equivalent per pound in cents.† |
|--------------------------------|-----------------------------|--|---------------------------------------|
| Sheet, fine ribbed smoked..... | \$139@145 | 2/8 3/4 @ 2/10 | 64.94 @ 67.40 |
| Sheet, good ribbed smoked..... | 134@140 | 2/7 3/4 @ 2/ 8 1/2 | 62.71 @ 65.16 |
| Sheet, plain smoked..... | 126@136 | 2/6 @ 2/ 8 | 59.48 @ 63.44 |
| Sheet, ribbed unsmoked..... | 124@134 | 2/5 1/4 @ 2/ 7 1/2 | 58.49 @ 62.71 |
| Sheet, plain unsmoked..... | 119@129 | 2/4 1/2 @ 2/ 6 1/2 | 56.51 @ 60.73 |
| Crêpe, fine pale..... | 140@147 | 2/8 3/4 @ 2/10 1/2 | 65.16 @ 68.15 |
| Crêpe, good pale..... | 134@139 | 2/7 3/4 @ 2/ 8 1/2 | 62.71 @ 64.94 |
| Crêpe, fine brown..... | 126@134 | 2/6 @ 2/ 7 1/2 | 59.48 @ 62.71 |
| Crêpe, good brown..... | 120@126 | 2/4 3/4 @ 2/ 4 3/4 | 57.02 @ 59.48 |
| Crêpe, dark..... | 105@120 | 2/1 3/4 @ 2/ 3 1/4 | 50.57 @ 57.02 |
| Crêpe, bark..... | 74@115 | 1/7 @ 2/ 3 1/4 | 37.66 @ 54.79 |
| Scrap, virgin..... | 85@101 | 1/9 1/4 @ 2/ 0 3/4 | 42.37 @ 49.10 |
| Scrap, pressed..... | 84@... | 1/9 1/4 @..... | 41.87 @..... |
| Scrap, loose..... | 75 @ 86 | 1/7 1/4 @ 1/ 9 1/4 | 38.16 @ 42.61 |

* Picul = 133 1/2 pounds.

† Figured at standard rate of exchange, 1s. = 23.8 cents.

Quoted in S. S. dollars = 2/4 [56.7 cents].

PLANTATION RUBBER FROM THE FAR EAST.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

| To— | From Singapore. October 31, 1916. | From Malacca. September 30, 1916. | From Penang. September 30, 1916. | From Port Swet- tenham. October 23, 1916. | Totals. |
|-------------------------|--|--|---|---|-------------|
| United Kingdom..... | 26,854,241 | 5,165,761 | 17,862,434 | 24,772,164 | 74,654,600 |
| The Continent | 9,366,270 | | 55,733 | | 9,422,003 |
| Japan | 3,508,344 | | | | 3,508,344 |
| Ceylon | 604,283 | | 476,000 | 1,410,064 | 2,490,347 |
| United States | 69,509,518 | | 7,644,267 | 1,301,867 | 78,455,652 |
| Australia | 268,392 | | | | 268,392 |
| Totals | 110,110,958 | 5,165,761 | 26,038,434 | 27,484,095 | 168,799,248 |
| Same period, 1915 | 66,782,158 | 6,159,464 | 21,338,264 | 24,988,802 | 119,268,688 |
| Same period, 1914 | 32,919,222 | 3,579,164 | 15,948,133 | 24,840,136 | 77,286,655 |
| Same period, 1913 | 21,830,702 | | 11,334,533 | 22,344,550 | 55,409,785 |

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to November 13, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

| To— | 1915. pounds | 1916. pounds |
|------------------------------|-----------------|-----------------|
| United States | 14,827,488 | 23,182,974 |
| Canada and Newfoundland..... | 384,940 | 6,720 |
| France | 497,892 | 1,501,037 |
| Russia | 332,200 | 248,874 |
| Italy | | 118,270 |
| United Kingdom | 21,005,124 | 18,666,268 |
| Australia | 725,017 | 769,791 |
| India | 1,000 | 1,358 |
| Straits Settlements | 119,933 | 43,680 |
| Japan | 260,421 | 301,589 |
| Totals | 38,154,015 | 44,840,561 |

(Same period 1914, 30,339,695 pounds; same period 1913, 21,990,065.) The export figures of rubber, given in the above table for 1914, include the imports re-exported. (These amount to 2,614,208 pounds from the Straits Settlements and 691,243 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur gives the figures of the export of plantation rubber from the Federated Malay States during the month of November as 6,776 tons, against 5,968 tons in October last and 4,636 tons in the corresponding period last year. This gives a total of 57,046 tons for eleven months of the current year against 39,413 tons in 1915 and 27,336 tons in 1914. Appended are the comparative figures:

| | 1914. | 1915. | 1916. |
|-----------------|-------|-------|-------|
| January | 2,542 | 3,473 | 4,471 |
| February | 2,364 | 3,411 | 5,207 |
| March | 2,418 | 3,418 | 4,429 |
| April | 2,151 | 2,777 | 3,914 |
| May | 2,069 | 2,708 | 3,956 |
| June | 2,306 | 3,403 | 5,114 |
| July | 2,971 | 3,687 | 5,053 |
| August | 1,850 | 3,796 | 5,782 |
| September | 2,879 | 3,984 | 6,376 |
| October | 2,897 | 4,120 | 5,968 |
| November | 2,889 | 4,636 | 6,776 |

Totals

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram from Singapore states that the export of plantation rubber from Straits Settlements ports in the month of October amounted to 5,233 tons. This establishes a new record, the previous best being 5,106 tons in July. The export in September was 2,987 tons and in October, 1915, 2,641 tons. The total export for ten months of the present year is 40,184 tons as against 27,594 tons for the corresponding period last year and 15,023 tons in 1914. Appended are the comparative statistics:

| | 1914. | 1915. | 1916. |
|-----------------|-------|-------|-------|
| January | 1,181 | 2,576 | 4,443 |
| February | 1,703 | 2,741 | 3,359 |
| March | 1,285 | 2,477 | 4,481 |
| April | 1,548 | 1,978 | 4,219 |
| May | 1,309 | 3,588 | 3,274 |
| June | 1,480 | 2,249 | 3,836 |
| July | 1,584 | 2,324 | 5,106 |
| August | 1,325 | 2,295 | 3,246 |
| September | 1,602 | 4,725 | 2,987 |
| October | 2,006 | 2,641 | 5,233 |

Totals

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements such as Borneo, Java, Sumatra and the non-Federated Malay States but do not include rubber exports from the Federated Malay States.

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.*

IMPORTS.

| From— | October, 1916. | | | | |
|----------------------|----------------|------------------|---------------|-----------------|-----------|
| | Para Rubber. | Para for Borneo. | Gutta Percha. | Gutta Jelutong. | |
| Malay Peninsula— | | | | | |
| Port Swettenham..... | 1,188,133 | 32,000 | | | |
| Muar | 622,800 | | | | |
| Teluk Anson | 569,997 | | | | |
| Penang | 410,000 | 43,466 | | | |
| Malacca | 352,400 | 744,273 | | | |
| Kelantan | 98,933 | 5,733 | | | |
| Port Dickson | 70,533 | | | | |
| Kuantan | 21,066 | | | | |
| Rengat | 20,000 | 11,200 | | | |
| Mersing | 8,000 | | | | |
| Totals | 3,361,862 | 836,672 | | | |
| Borneo— | | | | | |
| Bandjermassin | 95,733 | 20,666 | 800 | 9,333 | 236,133 |
| Sarawak | 87,066 | 22,533 | 400 | 10,800 | 479,600 |
| Pontianak | 65,466 | | 2,000 | 533 | 2,666 |
| Sambas | 41,200 | | | | 10,666 |
| Sibu | 30,933 | | 266 | 4,933 | 100,266 |
| Labuan | 20,933 | | 1,333 | | 10,933 |
| Jesselton | 19,200 | 132,933 | | 1,066 | |
| Passir | 14,000 | | | | |
| Sandakan | 4,933 | 3,333 | | | |
| Samarinda | 3,200 | | | 4,133 | |
| Sampit | 2,666 | | 1,333 | 4,000 | 166,666 |
| Singawang | 1,866 | | | | |
| Kudat | 666 | 30,800 | | | |
| Totals | 387,862 | 210,265 | 6,132 | 34,798 | 1,006,930 |

| From— | October, 1916. | | | | |
|--------------------|----------------|----------------------------|----------------|---------------|-----------------|
| | Para Rubber. | Para-Rubber for Treatment. | Borneo Rubber. | Gutta Percha. | Gutta Jelutong. |
| Sumatra— | | | | | |
| Djambi | 118,266 | | | | |
| Deli | 46,633 | 263,333 | | | |
| Indraghiri | 35,866 | 18,266 | | | 9,866 |
| Palembang | 7,866 | | | | 293,600 |
| Asahan | 4,133 | 101,066 | | | |
| Muntok | 3,866 | | | | |
| Siak | 1,866 | | | | |
| Bengkalis | 1,733 | | | | |
| Belawan | | 131,866 | | | |
| Totals | 210,229 | 534,531 | | | 303,466 |
| Java— | | | | | |
| Sourabaya | 190,860 | | | | |
| Batavia | 175,200 | | | | |
| Totals | 366,060 | | | | |
| Siam— | | | | | |
| Bangkok | 533 | | | | |
| Patani | 400 | | | | |
| Totals | 933 | | | | |
| Burma— | | | | | |
| Mergui | 5,466 | | | | |
| Hongkong | 3,466 | | | | |
| Other Ports | 167,866 | 123,466 | 6,133 | 5,466 | 84,666 |
| Grand Totals | 4,503,684 | 1,704,934 | 12,265 | 40,264 | 1,395,062 |

EXPORTS.

| To— | October, 1916. | | | | |
|----------------------------|----------------|-----------|----------------|---------------|-----------------|
| | Para Rubber | | Borneo Rubber. | Gutta Percha. | Gutta Jelutong. |
| NORTH AMERICA: | | | | | |
| United States— | | | | | |
| New York | 3,702,533 | 348,933 | | 98,933 | 1,338,800 |
| Akron | 2,218,700 | 678,400 | | | |
| San Francisco | 92,800 | 6,666 | | | |
| Boston | 60,633 | | | | 147,733 |
| Seattle | | 27,066 | | | 109,100 |
| Canada— | | | | | |
| Ontario (Toronto) | 46,400 | | | | |
| Totals | 6,121,066 | 1,061,065 | | 98,933 | 1,595,633 |
| EUROPE: | | | | | |
| United Kingdom— | | | | | |
| England— | | | | | |
| Liverpool | 213,066 | 233,733 | | 56,266 | 121,200 |
| London | 196,490 | 889,466 | | 102,540 | 67,600 |
| Russia (Vladivostok) | 538,266 | | | | |
| France (Marseilles) | 32,800 | | | 22,933 | |
| Totals | 980,532 | 1,123,199 | | 181,739 | 188,800 |
| Grand Totals | 7,101,598 | 2,184,264 | | 280,672 | 1,784,433 |

*Not complete. Imports and Exports from October 6 to October 11, inclusive, not received at this office.

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

[The Figures Indicate Weights in Pounds.]

NOVEMBER 24.—By the steamer *Dominic* from Pará:

| | Fine. | Medium. | Coarse. | Cauch. | Total. |
|--------------------------------|---------|---------|---------|--------|---------|
| Meyer & Brown | 89,100 | 2,500 | 8,000 | 36,000 | 135,600 |
| Paul Bertuch | 222,000 | | | | 222,000 |
| Arnold & Zeiss | 107,100 | 6,200 | 14,700 | | 128,000 |
| Davies, Turner & Co. | 97,700 | 10,400 | | 13,100 | 121,200 |
| H. A. Astlett & Co. | 44,100 | 8,600 | 47,900 | | 100,600 |
| Pell & Dumont | 12,500 | | 22,500 | | 35,000 |
| Balfour, Williamson & Co. | | | 11,000 | 23,400 | 34,400 |
| General Rubber Co. | 24,000 | 500 | 600 | | 25,100 |
| F. D. Duerr & Co. | 7,100 | | 1,100 | 13,500 | 21,700 |
| Henderson & Korn | | | 16,500 | | 16,500 |
| Totals | 603,600 | 28,200 | 122,300 | 86,000 | 840,100 |

NOVEMBER 25.—By the steamer *Francis* from Pará and Manaos:

| | Fine. | Medium. | Coarse. | Cauch. | Total. |
|-------------------------------|---------|---------|---------|--------|---------|
| Meyer & Brown | 10,100 | 34,400 | | | 44,500 |
| General Rubber Co. | 237,800 | 21,800 | 9,300 | 500 | 269,400 |
| Arnold & Zeiss | 152,500 | 8,700 | 18,500 | 100 | 179,800 |
| H. A. Astlett & Co. | 70,000 | 38,200 | 18,600 | 4,700 | 131,500 |
| Paul Bertuch | 44,700 | 18,800 | 32,400 | 300 | 96,200 |
| Aldens' Successors, Ltd. | 9,400 | | 45,000 | | 54,400 |
| Davies, Turner & Co. | 49,300 | | | | 49,300 |
| Henderson & Korn | | | 13,800 | 22,700 | 36,500 |
| Robinson & Co. | | 6,000 | 10,600 | | 16,600 |
| Totals | 563,700 | 103,600 | 182,600 | 28,300 | 878,200 |

NOVEMBER 28.—By the steamer *Acre* from Pará and Manaos:

| | Fine. | Medium. | Coarse. | Cauch. | Total. |
|-------------------------------|---------|---------|---------|--------|---------|
| Meyer & Brown | 58,100 | 14,700 | 23,500 | 1,200 | 97,500 |
| Henderson & Korn | 109,500 | 4,800 | 19,200 | 47,600 | 181,100 |
| General Rubber Co. | 39,600 | 400 | 55,700 | | 95,700 |
| Davies, Turner & Co. | 56,000 | 6,200 | | 8,800 | 71,000 |
| Muller, Schall & Co. | 64,300 | | 1,100 | | 65,400 |
| Paul Bertuch | 42,000 | 2,500 | 4,700 | 1,400 | 50,300 |
| Arnold & Zeiss | 34,300 | 1,100 | 3,200 | | 38,600 |
| G. Amsinck & Co. | 19,100 | | 3,600 | 9,500 | 32,200 |
| Pell & Dumont | | | 31,000 | | 31,000 |
| Neuss, Hesslein & Co. | 17,600 | | | 7,800 | 25,400 |
| Raw Products Co. | 19,800 | 1,700 | 500 | | 22,000 |
| H. A. Astlett & Co. | | | 19,200 | | 19,200 |
| Aldens' Successors, Ltd. | 1,200 | 1,200 | 12,400 | | 14,800 |
| Hagemeyer & Brunn | 1,300 | | 1,200 | 1,200 | 3,700 |
| Various | 2,700 | 200 | 100 | 1,300 | 4,300 |
| Totals | 465,500 | 32,800 | 175,400 | 78,500 | 752,200 |

DECEMBER 1.—By the steamer *Rio de Janeiro* from Pará and Manaos:

| | Fine. | Medium. | Coarse. | Cauch. | Total. |
|------------------------------|---------|---------|---------|--------|---------|
| Meyer & Brown | 45,000 | 2,400 | 2,800 | | 50,200 |
| Muller, Schall & Co. | 60,200 | 6,500 | 19,000 | 1,800 | 87,500 |
| Aldens' Successor, Ltd. | 1,200 | 14,000 | 18,000 | | 33,200 |
| Arnold & Zeiss | 8,000 | 400 | 20,000 | | 28,400 |
| Pell & Dumont | 900 | 400 | 24,100 | | 25,400 |
| Crossman & Sienchen | | | 2,000 | 11,600 | 13,600 |
| H. A. Astlett & Co. | 1,800 | | 11,300 | | 13,100 |
| Various | 2,700 | 400 | 1,200 | 200 | 4,500 |
| Totals | 119,800 | 24,100 | 97,400 | 13,600 | 255,900 |

| PARAS. | | POUNDS. | | POUNDS. | | POUNDS. | |
|---|--|---|--|--|--|---------|--|
| NOVEMBER 17.—By the <i>Hostilins</i> =Montevideo: | | NOVEMBER 21.—By the <i>Falcon</i> =Corinto: | | P. Tremari Successors | | 800 | |
| A. D. Straus & Co. (Fine) | | G. Amsinck & Co. | | General Export & Commission Co. | | 200 | |
| 20,000 | | A. Rosenthal & Sons | | NOVEMBER 28.—By the <i>Panama</i> =Colon: | | | |
| CENTRALS. | | NOVEMBER 22.—By the <i>Metapan</i> =Port Limon: | | G. Amsinck & Co. | | 17,000 | |
| [*This sign, in connection with imports of Centrals, denotes Guayule rubber.] | | A. A. Linde & Co. | | Dumarest Bros. | | 4,700 | |
| NOVEMBER 23.—By the <i>Advance</i> =Colon: | | NOVEMBER 23.—By the <i>Advance</i> =Colon: | | Pablo, Calvet & Co. | | 6,200 | |
| G. Amsinck & Co. (Cauch.) | | G. Amsinck & Co. | | NOVEMBER 28.—By the <i>Monterey</i> =Mexico: | | *12,000 | |
| 19,500 | | NOVEMBER 23.—By the <i>Ancon</i> =Colon: | | C. Tenhardt Sons & Co. | | | |
| NOVEMBER 23.—By the <i>Ancon</i> =Colon: | | G. Amsinck & Co. | | NOVEMBER 28.—By the <i>Pastores</i> =Port Limon: | | | |
| G. Amsinck & Co. (Fine) | | Otto Gerdau | | Isaac Brandon & Bros. | | 1,000 | |
| 18,000 | | Neuss, Hesslein & Co. | | Fernandez Sons Co. | | 500 | |
| G. Amsinck & Co. (Coarse) | | A. M. Capen's Sons | | G. Amsinck & Co. | | 200 | |
| 2,000 | | American Trading Co. | | DECEMBER 1.—By the <i>Tiviter</i> =Colombia: | | 1,500 | |
| G. Amsinck & Co. (Cauch.) | | Harburger & Stack | | G. Amsinck & Co. | | | |
| 54,000 | | W. R. Grace & Co. | | DECEMBER 2.—By the <i>Saramacca</i> =Barrios: | | | |
| Muller, Schall & Co. (Fine) | | Lawrence Johnson & Co. | | A. Rosenthal & Sons | | 3,500 | |
| 20,500 | | Andean Trading Co. | | J. S. Sembrada & Co. | | 800 | |
| Muller Schall & Co. (Coarse) | | J. S. Sembrada & Co. | | W. R. Grace & Co. | | 1,500 | |
| 1,000 | | P. A. Andrade Sons | | DECEMBER 6.—By the <i>Cristobal</i> =Colon: | | | |
| Muller Schall & Co. (Cauch.) | | Various | | G. Amsinck & Co. | | 8,500 | |
| 2,500 | | NOVEMBER 24.—By the <i>Preston</i> =Colombia: | | Pablo, Calvet & Co. | | 7,600 | |
| Neuss, Hesslein & Co. (Fine) | | G. Amsinck & Co. | | A. M. Capen's Sons | | 4,200 | |
| 7,000 | | NOVEMBER 28.—By the <i>Monterey</i> =Mexico: | | H. Wolff & Co. | | 3,000 | |
| Neuss, Hesslein & Co. (Coarse) | | U. S. Brokerage Co. | | W. R. Grace & Co. (Coarse) | | 2,500 | |
| 1,000 | | | | G. Amsinck & Co. (Coarse) | | 2,500 | |
| NOVEMBER 28.—By the <i>Panama</i> =Colon: | | | | J. S. Sembrada & Co. | | 800 | |
| G. Amsinck & Co. (Fine) | | | | | | | |
| 4,000 | | | | | | | |
| G. Amsinck & Co. (Coarse) | | | | | | | |
| 2,500 | | | | | | | |
| Muller Schall & Co. (Fine) | | | | | | | |
| 10,000 | | | | | | | |
| Muller Schall & Co. (Coarse) | | | | | | | |
| 6,000 | | | | | | | |
| W. R. Grace & Co. (Fine) | | | | | | | |
| 2,000 | | | | | | | |
| NOVEMBER 17.—By the <i>Santa Maria</i> =Cartagena: | | | | | | | |
| G. Amsinck & Co. | | | | | | | |
| 6,800 | | | | | | | |
| A. Held | | | | | | | |
| 200 | | | | | | | |
| 7,000 | | | | | | | |

| POUNDS. | |
|---|--------|
| DECEMBER 8.—By the <i>Carrillo</i> =Cartagena: | |
| G. Amsinck & Co. | 1,000 |
| DECEMBER 9.—By the <i>Jalisco</i> =Corinto: | |
| R. G. Barthold | 700 |
| G. Amsinck & Co. | 300 |
| DECEMBER 11.—By the <i>Esperanza</i> =Mexico: | |
| H. Marquard & Co. | 1,000 |
| J. A. Medina & Co. | 500 |
| DECEMBER 11.—By the <i>Tenadores</i> =Port Limon: | |
| Isaac Brandon & Bros. | 1,000 |
| Eggers & Heinlein | 100 |
| Fruit Despatch Co. | 100 |
| DECEMBER 12.—By the <i>Colon</i> =Colon: | |
| G. Amsinck & Co. | 15,000 |
| L. Tous & Co. | 5,200 |
| Piza Nephews & Co. | 4,000 |
| Andean Trading Co. | 2,500 |
| American Trading Co. | 2,500 |
| Lawrence Johnson & Co. | 700 |
| Various | 1,200 |

AFRICANS.

| | |
|---|--------|
| NOVEMBER 20.—By the <i>Carmania</i> =Liverpool: | |
| Arnold & Zeiss | 22,500 |
| Hagemeyer Trading Co. | 17,000 |
| NOVEMBER 20.—By the <i>Lepanto</i> =Hull: | |
| Rubber Trading Co. | 22,500 |
| NOVEMBER 21.—By the <i>Andree</i> =Havre: | |
| Various | 3,000 |
| NOVEMBER 21.—By the <i>Penmorean</i> =Havre: | |
| Various | 33,500 |
| NOVEMBER 23.—By the <i>Francisco</i> =Hull: | |
| Alden's Successors, Ltd. | 54,000 |
| Robert Badenhop & Co., Inc. | 20,000 |
| NOVEMBER 27.—By the <i>Philadelphia</i> =Liverpool: | |
| Goodyear Tire & Rubber Co. | 45,000 |
| NOVEMBER 27.—By the <i>Pannonia</i> =London: | |
| J. T. Johnstone & Co. | 22,000 |
| NOVEMBER 28.—By the <i>Laconia</i> =Liverpool: | |
| Fred Stern & Co. | 35,000 |
| DECEMBER 1.—By the <i>E. F. Venizelos</i> =Lisbon: | |
| Various | 90,000 |
| DECEMBER 4.—By the <i>Celtic</i> =Liverpool: | |
| Meyer & Brown | 11,500 |
| Henderson & Korn | 6,000 |
| Edward Maurer & Co., Inc. | 4,000 |
| DECEMBER 4.—By the <i>St. Louis</i> =Liverpool: | |
| Goodyear Tire & Rubber Co. | 22,500 |
| DECEMBER 4.—By the <i>Irrington Court</i> =Havre: | |
| Various | 11,000 |
| DECEMBER 4.—By the <i>Penistone</i> =Bordeaux: | |
| Robert Badenhop & Co., Inc. | 33,000 |
| Rubber Trading Co. | 11,200 |
| DECEMBER 5.—By the <i>Eastgate</i> =Havre: | |
| Various | 12,000 |
| DECEMBER 8.—By the <i>Baltic</i> =Liverpool: | |
| Henderson & Korn | 12,500 |
| DECEMBER 8.—By the <i>Finland</i> =Liverpool: | |
| Edward Maurer & Co., Inc. | 11,000 |
| DECEMBER 11.—By the <i>Orduna</i> =Liverpool: | |
| Rubber Trading Co. | 11,200 |
| Arnold & Zeiss | 95,000 |
| Hagemeyer Trading Co. | 25,000 |

MANICOUAS.

| | |
|---|--------|
| NOVEMBER 24.—By the <i>Dominic</i> =Ceara: | |
| Various | 66,000 |
| NOVEMBER 28.—By the <i>Laconia</i> =Liverpool: | |
| Arnold & Zeiss | 45,000 |
| DECEMBER 1.—By the <i>Rio de Janeiro</i> =Pernambuco: | |
| A. J. Hutter, Inc. | 10,000 |

PLANTATIONS.

| | |
|--|---------|
| NOVEMBER 20.—By the <i>Carmania</i> =Liverpool: | |
| Arnold & Zeiss | 13,500 |
| The B. F. Goodrich Co. | 1,500 |
| NOVEMBER 21.—By the <i>Minnehaha</i> =London: | |
| L. Littlejohn & Co. | 115,000 |
| Arnold & Zeiss | 115,000 |
| Rubber Trading Co. | 70,000 |
| NOVEMBER 23.—By the <i>City of Glasgow</i> =Colombo: | |
| Meyer & Brown | 240,000 |
| L. Littlejohn & Co. | 180,000 |

| POUNDS. | |
|---|---------|
| W. H. Stiles & Co. | 33,500 |
| Arnold & Zeiss | 17,000 |
| Various | 10,000 |
| NOVEMBER 27.—By the <i>Velodia</i> =London: | |
| The B. F. Goodrich Co. | 125,000 |
| L. Littlejohn & Co. | 80,000 |
| Robinson & Co. | 100,000 |
| General Rubber Co. | 250,000 |
| Goodyear Tire & Rubber Co. | 70,000 |
| Hagemeyer Trading Co. | 22,000 |
| J. T. Johnstone & Co. | 180,000 |
| Arnold & Zeiss | 115,000 |
| Various | 22,000 |

| | |
|--|---------|
| NOVEMBER 27.—By the <i>Port Hardy</i> =London: | |
| Meyer & Brown | 40,000 |
| W. H. Stiles & Co. | 30,000 |
| Edward Maurer & Co., Inc. | 36,000 |
| The B. F. Goodrich Co. | 80,000 |
| Michelin Tire Co. | 90,000 |
| J. T. Johnstone & Co. | 240,000 |
| Arnold & Zeiss | 75,000 |
| Hagemeyer Trading Co. | 35,000 |
| Robinson & Co. | 80,000 |
| General Rubber Co. | 115,000 |
| Aldens' Successors, Ltd. | 725,000 |
| Raw Products Co. | 22,500 |
| L. Littlejohn & Co. | 100,000 |

| | |
|--|---------|
| NOVEMBER 27.—By the <i>Kumeric</i> =Colombo: | |
| Meyer & Brown | 245,000 |
| L. Littlejohn & Co. | 320,000 |
| Arnold & Zeiss | 125,000 |
| W. H. Stiles & Co. | 22,500 |
| Robinson & Co. | 45,000 |
| J. T. Johnstone & Co. | 22,500 |
| Charles T. Wilson Co., Inc. | 16,000 |
| Aldens' Successors, Ltd. | 11,200 |
| Goodyear Tire & Rubber Co. | 15,000 |
| Edward Maurer & Co., Inc. | 9,000 |
| Various | 50,000 |

| | |
|--|---------|
| NOVEMBER 27.—By the <i>Pannonia</i> =London: | |
| The B. F. Goodrich Co. | 225,000 |
| Firestone Tire & Rubber Co. | 225,000 |
| J. T. Johnstone & Co. | 25,000 |
| Hagemeyer Trading Co. | 11,000 |
| Raw Products Co. | 4,500 |

| | |
|--|-------|
| NOVEMBER 28.—By the <i>Laconia</i> =Liverpool: | |
| Fred Stern & Co. | 5,000 |

| | |
|---|---------|
| NOVEMBER 28.—By the <i>Suruga</i> =Singapore: | |
| Meyer & Brown | 65,000 |
| General Rubber Co. | 170,000 |
| H. R. Jeffers | 11,000 |
| Edward Maurer & Co., Inc. | 85,000 |
| L. Littlejohn & Co. | 600,000 |
| Robert Badenhop & Co., Inc. | 60,000 |
| Henderson & Korn | 475,000 |
| Fred Stern & Co. | 50,000 |
| J. T. Johnstone & Co. | 225,000 |
| Fox & Co. | 27,000 |
| Goodyear Tire & Rubber Co. | 165,000 |
| Robinson & Co. | 300,000 |
| East Asiatic Co. | 90,000 |
| Aldens' Successors, Ltd. | 30,000 |
| Rubber Trading Co. | 30,000 |
| Arnold & Zeiss | 80,000 |
| Charles T. Wilson Co., Inc. | 60,000 |
| W. R. Grace & Co. | 60,000 |

| | |
|---|---------|
| DECEMBER 1.—By the <i>Hewick Hall</i> =Colombo: | |
| Meyer & Brown | 35,000 |
| L. Littlejohn & Co. | 265,000 |
| W. H. Stiles & Co. | 110,000 |
| Arnold & Zeiss | 140,000 |
| Various | 60,000 |

| | |
|---|---------|
| DECEMBER 4.—By the <i>Philadelphia</i> =London: | |
| General Rubber Co. | 120,000 |
| Fred Stern & Co. | 16,000 |
| Charles T. Wilson Co., Inc. | 25,000 |
| Raw Products Co. | 11,000 |
| L. Littlejohn & Co. | 9,000 |
| W. H. Stiles & Co. | 2,000 |

| POUNDS. | |
|---|---------|
| DECEMBER 4.—By the <i>Wakasa Maru</i> =Singapore: | |
| Meyer & Brown | 40,000 |
| Henderson & Korn | 335,000 |
| Robert Badenhop & Co., Inc. | 45,000 |
| Fox & Co. | 35,000 |
| Fred Stern & Co. | 30,000 |
| Arnold & Zeiss | 100,000 |
| W. R. Grace & Co. | 11,000 |
| Edward Maurer & Co., Inc. | 5,000 |
| United Malaysian Rubber Co. | 11,200 |
| East Asiatic Co. | 45,000 |
| J. T. Johnstone & Co. | 115,000 |
| L. Littlejohn & Co. | 265,000 |
| Rubber Trading Co. | 7,000 |
| Charles T. Wilson Co., Inc. | 110,000 |
| Robinson & Co. | 70,000 |
| Goodyear Tire & Rubber Co. | 50,000 |

| | |
|---|---------|
| DECEMBER 11.—By the <i>Lancastrian</i> =London: | |
| Goodyear Tire & Rubber Co. | 225,000 |
| Fred Stern & Co. | 135,000 |
| Michelin Tire Co. | 100,000 |
| L. Littlejohn & Co. | 35,000 |
| Rubber Trading Co. | 9,000 |

| | |
|---|-------|
| DECEMBER 11.—By the <i>Orduna</i> =Liverpool: | |
| Arnold & Zeiss | 4,500 |
| The B. F. Goodrich Co. | 4,500 |

| | |
|--|---------|
| DECEMBER 13.—By the <i>Keelung</i> =Colombo: | |
| Meyer & Brown | 460,000 |
| L. Littlejohn & Co. | 330,000 |
| W. H. Stiles & Co. | 100,000 |
| Arnold & Zeiss | 90,000 |
| W. R. Grace & Co. | 45,000 |
| Goodyear Tire & Rubber Co. | 33,600 |
| Robinson & Co. | 25,000 |
| J. T. Johnstone & Co. | 85,000 |
| Aldens' Successors, Ltd. | 13,500 |
| Charles T. Wilson Co., Inc. | 13,500 |
| Edward Maurer & Co., Inc. | 9,000 |
| Henderson & Korn | 25,000 |
| Various | 110,000 |

| | |
|---|---------|
| DECEMBER 13.—By the <i>Palacia</i> =London: | |
| L. Littlejohn & Co. | 230,000 |
| Hagemeyer Trading Co. | 25,000 |
| Raw Products Co. | 7,000 |
| The B. F. Goodrich Co. | 350,000 |
| Firestone Tire & Rubber Co. | 110,000 |
| Arnold & Zeiss | 160,000 |
| Edward Maurer & Co., Inc. | 160,000 |
| W. H. Stiles & Co. | 11,000 |
| General Rubber Co. | 60,000 |
| Robinson & Co. | 25,000 |

CRUDE RUBBER ARRIVALS AT SEATTLE.

Consignee is given first, followed by shippers.
Figured 130 pounds net to the case.

| PLANTATION. | |
|---|---------|
| TO AKRON. | POUNDS. |
| NOVEMBER 28.—By the steamer <i>Chicago Maru</i> . | |
| Firestone Tire & Rubber Co. | 132,340 |
| The Waterhouse Co. | |

| TO SEATTLE. | |
|--|-------|
| DECEMBER 9.—By the steamer <i>Awa Maru</i> . | |
| Nippon Yusen Kaisha. | |
| Nippon Yusen Kaisha | 1,300 |
| W. R. Grace & Co. | |
| Sandilands Buttery & Co. | 260 |

| TO SEATTLE. | |
|---|--------|
| DECEMBER 14.—By the <i>Sakai Maru</i> . | |
| Firestone Tire & Rubber Co. | 41,158 |
| The Waterhouse Co. | |
| Henderson & Korn. | 16,380 |
| East Asiatic Co. | |
| Goodyear Tire & Rubber Co. | |
| The Waterhouse Co. | 4,380 |

| TO AKRON. | |
|---|---------|
| DECEMBER 14.—By the <i>Talthybius</i> . | |
| H. B. M. Consul General. | |
| Wadleigh & Co. | 465,920 |
| Harrisons & Crosfield. | 335,920 |
| The Waterhouse Co. | 271,700 |
| Anglo-Malay Rubber Co. | 34,320 |
| Rubber Estates of Johore. | 23,140 |
| Duff Development Co. | 14,950 |
| Anglo-Sumatra Rubber Co. | 5,460 |

| TO NEW YORK. | |
|------------------------------------|-------|
| H. B. M. Consul General. | |
| Planters Stores & Agency Co. | 9,100 |
| Aylesburg & Nutter. | 6,370 |
| Runban Estate | 4,940 |
| Kuala Kai Kuantan Rubber Co., Ltd. | 4,290 |
| Kuali Pahi Rubber Estate, Ltd. | 2,730 |

| TO SEATTLE. | | | POUNDS. | | | VALUE. | | | DISTRICT OF MICHIGAN— | | | November, 1916. | | |
|---|-----------|-------------|---------|--|--|--------|--|--|-----------------------|--|--|-----------------|--|--|
| | | | | | | | | | IMPORTS: | | | POUNDS. | | |
| | | | | | | | | | Rubber scrap | | | 200,203 | | |
| | | | | | | | | | | | | VALUE. | | |
| | | | | | | | | | | | | | | |
| H. B. M. Consul General. | | | | | | | | | | | | | | |
| W. T. Easley | 411,190 | | | | | | | | | | | | | |
| C. W. Mackie & Co. | 47,060 | | | | | | | | | | | | | |
| George Stuart & Co. | 10,530 | | | | | | | | | | | | | |
| Cumberbatch, Ltd. | 9,100 | | | | | | | | | | | | | |
| Whittall & Co. | 4,550 | | | | | | | | | | | | | |
| Third Mile Rubber Co. | 4,550 | | | | | | | | | | | | | |
| Glensheil Rubber Estate Co. | 2,470 | | | | | | | | | | | | | |
| Sungie Purun Rubber Estate | 2,470 | | | | | | | | | | | | | |
| Sheras Rubber Estate | 2,470 | | | | | | | | | | | | | |
| Tangga Batu Rubber Co. | 1,830 | | | | | | | | | | | | | |
| Wadleigh & Co. | 130 | | | | | | | | | | | | | |
| Butterfield & Swire | 130 | 496,470 | | | | | | | | | | | | |
| TO SEATTLE. | | | | | | | | | | | | | | |
| December 15—By the steamer <i>Canada Maru</i> — | | | | | | | | | | | | | | |
| W. R. Grace & Co. | | | | | | | | | | | | | | |
| Penang Rubber Estates Co. | 11,050 | | | | | | | | | | | | | |
| GUTTA JELUTONG. | | | | | | | | | | | | | | |
| TO SAN FRANCISCO. | | | | | | | | | | | | | | |
| DECEMBER 14.—By the steamer <i>Sakai Maru</i> . | | | | | | | | | | | | | | |
| H. B. M. Consul General. | | | | | | | | | | | | | | |
| Borneo Surnaba Trading Co. | 5,460 | | | | | | | | | | | | | |
| TO SEATTLE. | | | | | | | | | | | | | | |
| L. Littlejohn & Co. | | | | | | | | | | | | | | |
| Katz Bros. | 49,660 | | | | | | | | | | | | | |
| CUSTOM HOUSE STATISTICS. | | | | | | | | | | | | | | |
| PORT OF SAN FRANCISCO—OCTOBER, 1916. | | | | | | | | | | | | | | |
| IMPORTS: | | | | | | | | | | | | | | |
| India rubber | 556,076 | \$303,509 | | | | | | | | | | | | |
| Manufactures of gutta percha | 20 | | | | | | | | | | | | | |
| Gutta jelutong (Pontianak). | 38,243 | 1,877 | | | | | | | | | | | | |
| Rubber scrap | 500 | 90 | | | | | | | | | | | | |
| Manufactures of india rubber | 113 | | | | | | | | | | | | | |
| Totals | 594,819 | \$305,609 | | | | | | | | | | | | |
| EXPORTS: | | | | | | | | | | | | | | |
| Reclaimed rubber | 6,091 | \$579 | | | | | | | | | | | | |
| India rubber boots | 532 | 3,613 | | | | | | | | | | | | |
| India rubber shoes | 3,607 | 2,852 | | | | | | | | | | | | |
| PORT OF CHICAGO—NOVEMBER, 1916. | | | | | | | | | | | | | | |
| IMPORTS: | | | | | | | | | | | | | | |
| Manufactures of india rubber | | \$104 | | | | | | | | | | | | |
| PORT OF CLEVELAND—NOVEMBER, 1916. | | | | | | | | | | | | | | |
| IMPORTS: | | | | | | | | | | | | | | |
| India rubber | 641,211 | \$320,047 | | | | | | | | | | | | |
| Rubber scrap | 1,888 | 330 | | | | | | | | | | | | |
| Manufactures of india rubber | 319 | | | | | | | | | | | | | |
| Totals | 643,099 | \$320,696 | | | | | | | | | | | | |
| PORTS OF SEATTLE AND TACOMA—NOVEMBER, 1916. | | | | | | | | | | | | | | |
| IMPORTS: | | | | | | | | | | | | | | |
| India rubber | 2,277,668 | \$1,142,588 | | | | | | | | | | | | |
| India rubber boots | 461 | 1,425 | | | | | | | | | | | | |
| India rubber shoes | 6,001 | 5,731 | | | | | | | | | | | | |
| Automobile tires | | 33,486 | | | | | | | | | | | | |
| Other rubber tires | | 1,396 | | | | | | | | | | | | |
| All other manufactures of india rubber | | 14,334 | | | | | | | | | | | | |
| Totals | | \$56,372 | | | | | | | | | | | | |
| PORT OF PHILADELPHIA—NOVEMBER, 1916. | | | | | | | | | | | | | | |
| IMPORTS: | | | | | | | | | | | | | | |
| Manufactures of india rubber | | \$29 | | | | | | | | | | | | |
| EXPORTS: | | | | | | | | | | | | | | |
| Automobile tires | | \$66,609 | | | | | | | | | | | | |
| Belted, hose, etc. | | 3,293 | | | | | | | | | | | | |
| All other manufactures of india rubber | | 6,380 | | | | | | | | | | | | |
| Totals | | \$76,282 | | | | | | | | | | | | |

EXPORTS OF INDIA RUBBER FROM PARA AND MANAOS DURING NOVEMBER, 1916.

| EXPORTERS. | NEW YORK. | | | | | EUROPE. | | | | | GRAND TOTALS. |
|-------------------------------|-----------|---------|---------|---------|-----------|---------|---------|---------|---------|-----------|---------------|
| | Fine. | Medium. | Coarse. | Caucho. | TOTALS. | Fine. | Medium. | Coarse. | Caucho. | TOTALS. | |
| J. Marques | 148,567 | 13,312 | 68,269 | 42,176 | 272,324 | | | | | | 272,324 |
| Stowell & Co. | 71,070 | 3,642 | 18,046 | | 92,758 | 79,007 | 5,350 | 2,137 | 41,575 | 128,069 | 220,827 |
| Suarez Hermanos & Co., Ltd. | 134,101 | 216 | 5,321 | 37,136 | 176,774 | | | | 22,033 | 22,033 | 198,807 |
| General Rubber Co. of Brazil. | 76,957 | 4,579 | 37,916 | 932 | 120,384 | 21,420 | 1,020 | | 1,132 | 23,572 | 143,956 |
| Adelbert H. Alden, Ltd. | 680 | 7,223 | 13,748 | | 21,651 | 82,283 | | | 7,852 | 90,135 | 111,786 |
| Pires Teixeira & Co. | 41,070 | 3,275 | 16,690 | 1,712 | 62,747 | 26,860 | 510 | | | 27,370 | 90,117 |
| Berringer & Co. | 11,815 | | 519 | 3,700 | 16,034 | | | | | | 16,034 |
| G. Fradelizi & Co. | 10,705 | 965 | 821 | 100 | 12,591 | | | | | | 12,591 |
| Seligmann & Co. | 8,594 | 92 | 437 | 2,592 | 11,765 | | | | | | 11,765 |
| Sundries | 4,395 | 1,190 | 21,313 | 12,926 | 39,324 | 3,850 | 769 | 557 | 32,636 | 37,812 | 77,136 |
| Exports from Manaos | 507,954 | 34,494 | 183,130 | 100,774 | 826,352 | 213,420 | 7,649 | 2,694 | 105,228 | 328,991 | 1,155,343 |
| Exports from Iquitos | 323,393 | 56,634 | 95,335 | 4,362 | 479,724 | 395,361 | 41,570 | 11,775 | 128,042 | 576,748 | 1,056,472 |
| Totals, November, 1916 | 831,347 | 91,128 | 278,465 | 105,136 | 1,306,076 | 777,886 | 60,979 | 59,652 | 330,117 | 1,228,634 | 2,534,710 |
| October, 1916 | 534,595 | 27,873 | 32,933 | 266,489 | 861,890 | 970,163 | 106,884 | 480,473 | 156,071 | 1,713,591 | 2,575,481 |
| September, 1916 | 869,014 | 90,689 | 329,205 | 75,342 | 1,364,250 | 639,662 | 39,213 | 27,798 | 193,476 | 900,249 | 2,264,499 |

EXPORTS OF INDIA RUBBER FROM MANAOS DURING NOVEMBER, 1916.

| EXPORTERS. | NEW YORK. | | | | | EUROPE. | | | | |
|------------|-----------|--|--|--|--|---------|--|--|--|--|
|------------|-----------|--|--|--|--|---------|--|--|--|--|

IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

IMPORTS.

| Week Ending— | India Rubber. | | Scrap for Re-manufacture. | | Balata. | Value. | Gutta Percha. | | Gutta Jelutong. | |
|------------------------|---------------|-----------|---------------------------|----------|---------|----------|---------------|--------|-----------------|---------|
| | Pounds. | Value. | Pounds. | Value. | Pounds. | | Pounds. | Value. | Pounds. | Value. |
| November 24, 1916..... | 2,681,951 | \$1,426* | 429,012 | \$32,702 | ..... | ..... | 1,733 | \$300 | 22,370 | \$2,672 |
| December 1, 1916..... | 5,122,247 | 2,654,454 | 542,325 | 37,847 | 45,386 | \$21,878 | ..... | ..... | ..... | ..... |
| December 8, 1916..... | 7,848,067 | 4,219,246 | 255,875 | 18,106 | 39,750 | 23,240 | 115,126 | 13,087 | ..... | ..... |
| December 15, 1916..... | 514,657 | 241,480 | 190,915 | 13,800 | 179,062 | 93,075 | 2,448 | 243 | ..... | ..... |

In addition to the above, 48,202 pounds of chiclé were imported, valued at \$23,011.

* Manufactures of India Rubber.

EXPORTS.

FIGURES ISSUED FROM NOVEMBER 25 TO DECEMBER 23, 1916.

| EXPORTED TO— | Belting, Hose and Packing. | Footwear. | | Tires. | | Insulated Wire and Cables. | Other mnf. of India Rubber. | Fountain Pens. | Chewing Gum. | Reclaimed Rubber. | Scrap Rubber. |
|-----------------------------|----------------------------------|-----------|----------|-----------|----------|----------------------------------|-----------------------------------|-------------------|-----------------|----------------------|------------------|
| | | Boots. | Shoes. | Auto. | Other. | | | | | | |
| NORTH AMERICA: | | | | | | | | | | | |
| Bermuda..... | \$26 | \$31 | \$555 | ..... | \$123 | \$297 | \$1,070 | ..... | ..... | ..... | ..... |
| British Honduras..... | ..... | ..... | 64 | ..... | 20 | ..... | 55 | ..... | ..... | ..... | ..... |
| Central American States— | | | | | | | | | | | |
| Costa Rica..... | 1,741 | ..... | 75 | \$51 | ..... | 324 | 605 | ..... | \$528 | ..... | ..... |
| Guatemala..... | 612 | ..... | ..... | 151 | 82 | ..... | 643 | \$253 | 355 | ..... | ..... |
| Honduras..... | 347 | ..... | 24 | 2,493 | ..... | 6 | 288 | ..... | ..... | ..... | ..... |
| Nicaragua..... | ..... | ..... | ..... | ..... | ..... | ..... | 502 | ..... | 45 | ..... | ..... |
| Panama..... | 4,619 | 25 | 7,145 | 2,566 | 1,520 | 15,544 | 2,876 | 78 | 2,074 | ..... | ..... |
| Salvador..... | 460 | ..... | ..... | 541 | 39 | 210 | 1,143 | ..... | 20 | ..... | ..... |
| Mexico..... | 6,715 | ..... | ..... | 11,107 | 565 | 13,223 | 6,521 | ..... | 62 | ..... | ..... |
| Newfoundland..... | 735 | 657 | 3,955 | ..... | ..... | 384 | 861 | ..... | 928 | ..... | ..... |
| West Indies— | | | | | | | | | | | |
| British— | | | | | | | | | | | |
| Barbados..... | 241 | ..... | ..... | 592 | ..... | 55 | 414 | 49 | ..... | ..... | ..... |
| Jamaica..... | 63 | ..... | 116 | 3,087 | ..... | 82 | 824 | 17 | 6 | ..... | ..... |
| Trinidad and Tobago..... | 170 | ..... | 201 | 3,227 | 560 | 205 | 1,588 | ..... | ..... | ..... | ..... |
| Other British..... | 269 | ..... | 133 | 1,651 | 156 | 162 | 676 | 20 | ..... | ..... | ..... |
| Cuba..... | 15,452 | ..... | 1,024 | 64,202 | 14,580 | 30,230 | 24,243 | 6 | 2,360 | ..... | ..... |
| Danish..... | ..... | ..... | 77 | 559 | ..... | 49 | 129 | ..... | 2 | ..... | ..... |
| Dutch..... | 816 | ..... | 100 | 171 | 98 | ..... | 251 | ..... | ..... | ..... | ..... |
| French..... | 311 | ..... | 7 | 325 | 385 | ..... | 164 | ..... | ..... | ..... | ..... |
| Haiti..... | 35 | 12 | 94 | 146 | 119 | 101 | 302 | 4 | 48 | ..... | ..... |
| Santo Domingo..... | 1,612 | 10 | ..... | 1,134 | 1,362 | 521 | 4,138 | 6 | 477 | ..... | ..... |
| Totals, North America..... | \$34,224 | \$735 | \$13,570 | \$92,003 | \$19,615 | \$61,393 | \$47,293 | \$433 | \$6,917 | ..... | ..... |
| EUROPE: | | | | | | | | | | | |
| Denmark..... | ..... | ..... | ..... | ..... | ..... | \$3,000 | \$254 | ..... | ..... | ..... | ..... |
| France..... | \$280 | \$360,868 | \$10,834 | \$5,341 | \$2,668 | 334,708 | 22,127 | 1,829 | \$10,212 | ..... | ..... |
| Greece..... | 569 | ..... | ..... | ..... | ..... | ..... | 170 | ..... | ..... | ..... | ..... |
| Iceland..... | ..... | ..... | ..... | ..... | ..... | ..... | 2,831 | ..... | ..... | ..... | ..... |
| Italy..... | 273 | 5 | 83 | ..... | 1,380 | 3,300 | 2,523 | ..... | ..... | ..... | ..... |
| Netherlands..... | 93 | ..... | ..... | ..... | ..... | 5,017 | 3,689 | 476 | ..... | ..... | ..... |
| Norway..... | ..... | ..... | ..... | ..... | ..... | 20,097 | 60 | 211 | ..... | ..... | ..... |
| Portugal..... | 957 | ..... | ..... | ..... | ..... | 35 | 319 | 259 | ..... | ..... | ..... |
| Russia in Europe..... | ..... | ..... | ..... | 60,338 | ..... | 11,341 | ..... | ..... | ..... | ..... | ..... |
| Spain..... | 101 | ..... | ..... | 2,386 | ..... | 54 | 908 | 155 | ..... | ..... | ..... |
| Sweden..... | 37,176 | ..... | ..... | ..... | ..... | 3,600 | 70 | ..... | ..... | ..... | ..... |
| Switzerland..... | ..... | ..... | ..... | ..... | ..... | 383 | ..... | ..... | ..... | ..... | ..... |
| United Kingdom— | | | | | | | | | | | |
| England..... | 23,922 | 35,994 | 60,123 | 323,094 | 39,132 | 78,762 | 148,404 | 119 | 56,658 | \$2,100 | \$19,368 |
| Scotland..... | 4,721 | ..... | 1,366 | ..... | ..... | ..... | 218 | 218 | 581 | ..... | 11,637 |
| Ireland..... | ..... | ..... | ..... | ..... | ..... | 40 | ..... | ..... | ..... | ..... | ..... |
| Totals, Europe..... | \$68,092 | \$396,867 | \$72,406 | \$391,159 | \$43,180 | \$460,337 | \$181,573 | \$4,151 | \$67,451 | \$2,100 | \$31,005 |
| SOUTH AMERICA: | | | | | | | | | | | |
| Argentina..... | \$6,531 | ..... | \$563 | \$87,132 | \$1,718 | \$8,864 | \$18,708 | ..... | \$620 | ..... | ..... |
| Bolivia..... | 319 | ..... | ..... | 239 | 533 | 1,470 | 10 | ..... | ..... | ..... | ..... |
| Brazil..... | 16,448 | \$138 | 3,315 | 22,317 | 665 | 64,368 | 32,865 | \$1,691 | 97 | ..... | ..... |
| Chile..... | 9,136 | ..... | 1,306 | 10,399 | 431 | 54,588 | 18,687 | 88 | 315 | ..... | ..... |
| Colombia..... | 965 | ..... | ..... | 1,986 | 229 | 1,018 | 3,419 | ..... | ..... | ..... | ..... |
| Ecuador..... | 165 | ..... | ..... | 1,242 | ..... | 1,105 | 802 | 12 | 292 | ..... | ..... |
| Guiana—British..... | 12 | ..... | ..... | 627 | ..... | 16 | 256 | ..... | 3 | ..... | ..... |
| Dutch..... | ..... | ..... | ..... | 196 | 15 | 2 | 229 | ..... | ..... | ..... | ..... |
| French..... | ..... | ..... | ..... | ..... | ..... | ..... | 6 | ..... | ..... | ..... | ..... |
| Peru..... | 770 | ..... | ..... | 570 | 178 | 14,826 | 1,774 | 18 | ..... | ..... | ..... |
| Uruguay..... | 367 | ..... | 780 | 6,163 | ..... | 13,853 | 2,406 | 20 | 200 | ..... | ..... |
| Venezuela..... | 693 | ..... | ..... | 5,534 | 4,005 | 1,786 | 4,817 | ..... | 20 | ..... | ..... |
| Totals, South America..... | \$35,404 | \$138 | \$5,964 | \$136,405 | \$7,774 | \$161,896 | \$83,973 | \$1,835 | \$1,547 | ..... | ..... |
| ASIA: | | | | | | | | | | | |
| China..... | \$870 | ..... | ..... | ..... | ..... | ..... | \$109 | ..... | ..... | ..... | ..... |
| British India..... | 1,315 | ..... | \$466 | \$3,017 | ..... | ..... | 1,627 | \$304 | ..... | ..... | ..... |
| Straits Settlements..... | ..... | \$158 | ..... | 1,036 | ..... | ..... | 98 | ..... | ..... | ..... | ..... |
| Dutch East Indies..... | 775 | ..... | ..... | 8,800 | \$5,130 | \$15,592 | 1,425 | 115 | ..... | ..... | ..... |
| Hongkong..... | ..... | ..... | ..... | 65 | ..... | ..... | 43 | ..... | ..... | ..... | ..... |
| Japan..... | ..... | ..... | ..... | ..... | ..... | 383 | 94 | ..... | ..... | ..... | \$1,263 |
| Korea..... | 184 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Siam..... | 94 | ..... | ..... | 707 | ..... | 194 | 541 | ..... | ..... | ..... | ..... |
| Totals, Asia..... | \$3,238 | \$158 | \$466 | \$13,625 | \$5,130 | \$16,169 | \$3,937 | \$419 | ..... | ..... | \$1,263 |
| OCEANIA: | | | | | | | | | | | |
| British..... | | | | | | | | | | | |
| Australia and Tasmania..... | \$2,110 | ..... | \$4,637 | \$6,134 | ..... | \$8,445 | \$1,398 | ..... | \$570 | ..... | ..... |
| New Zealand..... | 346 | ..... | 275 | 18,831 | ..... | 460 | 2,007 | ..... | 203 | ..... | ..... |
| Philippine Islands..... | 828 | ..... | 7,487 | 95 | 1,370 | 1,317 | 4,700 | ..... | 1,747 | ..... | ..... |
| Totals, Oceania..... | \$3,284 | ..... | \$12,399 | \$25,060 | \$2,363 | \$10,222 | \$8,105 | ..... | \$2,520 | ..... | ..... |
| AFRICA: | | | | | | | | | | | |
| British Africa— | | | | | | | | | | | |
| West..... | ..... | ..... | ..... | ..... | ..... | ..... | \$314 | ..... | ..... | ..... | ..... |
| South..... | \$17,419 | \$2,944 | \$4,192 | \$10,587 | \$9 | \$4,750 | 2,204 | ..... | \$485 | ..... | ..... |
| Canary Islands..... | ..... | ..... | ..... | ..... | ..... | ..... | 57 | ..... | ..... | ..... | ..... |
| Egypt..... | ..... | ..... | ..... | ..... | ..... | ..... | 201 | ..... | 225 | ..... | ..... |
| Portuguese Africa..... | 682 | ..... | 28 | ..... | ..... | ..... | 269 | ..... | 26 | ..... | ..... |
| Totals, Africa..... | \$18,101 | \$2,944 | \$4,220 | \$10,587 | \$9 | \$4,750 | \$3,045 | ..... | \$736 | ..... | ..... |

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

| UNMANUFACTURED—free: | September, 1916. | |
|--|------------------|-------------|
| | Pounds. | Value. |
| India rubber: | | |
| From— | | |
| France | 7,725 | \$2,846 |
| Portugal | | |
| United Kingdom | 1,966,831 | 967,162 |
| Central America and British Honduras | 121,264 | 55,024 |
| Mexico | 68,008 | 30,737 |
| Brazil | 4,492,914 | 2,128,985 |
| Other South America | 344,745 | 125,227 |
| East Indies | 11,549,947 | 6,156,142 |
| Other countries | 44,483 | 8,367 |
| Totals | 18,595,917 | \$9,474,490 |
| Balata | 229,378 | 106,258 |
| Guayule gum | 244,940 | 67,295 |
| Gutta jelutong | 1,117,146 | 53,120 |
| Gutta percha | 585,535 | 235,993 |
| Totals | 20,762,916 | \$9,937,156 |
| Rubber scrap | 736,245 | 51,470 |
| Totals, unmanufactured | 21,499,161 | \$9,988,626 |
| Chicle | dutiable 682,586 | \$312,891 |
| MANUFACTURED—dutiable: | | |
| Gutta percha | | \$35,871 |
| India rubber | | 47,844 |
| Totals, manufactured | | \$83,715 |
| Substitutes—elasticon, etc. | | |

EXPORTS OF DOMESTIC MERCHANDISE.

| MANUFACTURED— | September, 1916. | |
|---------------------------------|------------------|-------------|
| | Pounds. | Value. |
| Automobile tires: | | |
| To— | | |
| †Russia in Europe | | \$596 |
| England | | 72,465 |
| Canada | | 66,180 |
| Mexico | | 8,577 |
| Cuba | | 62,626 |
| Australia | | 56,067 |
| New Zealand | | 24,999 |
| Philippine Islands | | 19,506 |
| Other countries | | 306,198 |
| Total | | \$617,214 |
| All other tires | | 136,323 |
| Belting, hose and packing | | 247,114 |
| Rubber boots | | 43,789 |
| Rubber shoes | | 362,853 |
| Scrap and old rubber | | 628,749 |
| Reclaimed rubber | | 219,017 |
| Other rubber manufactures | | 630,288 |
| Totals, manufactured | | \$1,990,316 |
| Fountain pens | number 21,323 | \$15,412 |

EXPORTS OF FOREIGN MERCHANDISE.

| UNMANUFACTURED— | September, 1916. | |
|-------------------------------|------------------|-----------|
| | Pounds. | Value. |
| Balata | 135,307 | \$67,254 |
| Guayule gum | | |
| Gutta jelutong | | |
| Gutta percha | 384,114 | 187,091 |
| India rubber | | |
| Rubber scrap and refuse | | |
| Totals, unmanufactured | 519,421 | \$254,345 |
| Chicle | 262,184 | \$98,933 |
| MANUFACTURED— | | |
| Gutta percha | | |
| India rubber | | \$219 |
| Total, manufactured | | \$219 |

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

| MANUFACTURED— | September, 1916. | |
|---------------------------------|------------------|----------|
| | Pounds. | Value. |
| To— | | |
| Alaska: | | |
| Belting, hose and packing | | \$12,029 |
| Boots and shoes | 15,979 | 30,839 |
| Other rubber goods | | 7,047 |
| Total | | \$49,915 |
| To— | | |
| Hawaii: | | |
| Belting, hose and packing | | \$5,960 |
| Automobile tires | | 56,340 |
| Other tires | | 7,074 |
| Other rubber goods | | 10,413 |
| Total | | \$79,787 |
| To— | | |
| Philippine Islands: | | |
| Belting, hose and packing | | \$2,708 |
| Boots and shoes | 37,771 | 28,835 |
| Tires | | 32,054 |
| Other rubber goods | | 10,901 |
| Total | | \$74,498 |
| To— | | |
| Porto Rico: | | |
| Belting, hose and packing | | \$3,764 |
| Automobile tires | | 61,191 |
| Other tires | | 923 |
| Other rubber goods | | 12,999 |
| Total | | \$78,877 |

*Dutiable beginning July 1, 1916.
†Not separately stated prior to January 1, 1916.

RUBBER STATISTICS FOR THE DOMINION OF CANADA. IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

| UNMANUFACTURED—free: | September, 1916. | |
|--|------------------|-----------|
| | Pounds. | Value. |
| Rubber and gutta percha, crude caoutchouc or india rubber: | | |
| From— | | |
| Great Britain | 411,991 | \$224,467 |
| United States | 349,139 | 163,254 |
| Totals | 761,130 | \$387,721 |
| Rubber, recovered: | | |
| From— | | |
| United States | 200,506 | \$19,931 |
| Hard rubber, in sheets and rods: | | |
| From— | | |
| United States | 496 | \$498 |
| Rubber substitute: | | |
| From— | | |
| United States | 26,614 | \$2,411 |
| Rubber, powdered, and rubber or gutta percha waste: | | |
| From— | | |
| United States | 56,431 | \$1,583 |
| Other countries | 47,049 | 3,411 |
| Totals | 103,480 | \$4,994 |
| Rubber thread, not covered: | | |
| From— | | |
| United States | 3,082 | \$4,482 |
| Balata, crude: | | |
| From— | | |
| United States | 965 | \$791 |
| Chicle, crude: | | |
| From— | | |
| United States | 121,160 | \$56,106 |
| British Honduras | 464,571 | 168,225 |
| Mexico | 69,081 | 26,098 |
| Totals | 654,812 | \$250,429 |

| MANUFACTURED—dutiable: | September, 1916. | |
|---|-----------------------|----------------------------|
| | General Tariff Value. | Preferential Tariff Value. |
| Boots and shoes: | | |
| From— | | |
| United States | | \$13,187 |
| Belting: | | |
| From— | | |
| United States | | \$9,082 |
| Waterproof clothing: | | |
| From— | | |
| Great Britain | | \$75 |
| United States | | 20,146 |
| Total | | \$20,221 |
| Hose, lined with rubber: | | |
| From— | | |
| United States | | \$10,818 |
| Mats and matting: | | |
| From— | | |
| Great Britain | | \$4 |
| United States | | 126 |
| Total | | \$130 |
| Packing: | | |
| From— | | |
| United States | | \$4,748 |
| Tires of rubber for all vehicles: | | |
| From— | | |
| United States | | \$90,826 |
| France | | 668 |
| Total | | \$91,494 |
| Rubber cement, and all other manufactures of india rubber and gutta percha, N. O. P.: | | |
| From— | | |
| Great Britain | | \$296 |
| United States | | 52,442 |
| Other countries | | 550 |
| Total | | \$53,288 |
| Hard rubber in tubes: | | |
| From— | | |
| United States | | \$1,401 |
| Webbing—over one inch wide: | | |
| From— | | |
| United States | | \$24,968 |

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

| MANUFACTURED— | September, 1916. | |
|-----------------------|--------------------------|------------------------------------|
| | Produce of Canada Value. | Re-exports of Foreign Goods Value. |
| Belting: | | |
| To— | | |
| United States | | \$11 |
| Newfoundland | | \$226 |
| Other countries | | 146 |
| Totals | | \$372 |
| Hose— | | |
| To— | | |
| Great Britain | | \$13,764 |
| United States | | 28 |
| Newfoundland | | 346 |
| Other countries | | 4,828 |
| Totals | | \$18,966 |
| Boots and shoes: | | |
| To— | | |
| Great Britain | | \$58,272 |
| Newfoundland | | 8,680 |
| Australia | | 2,505 |
| New Zealand | | 3,309 |
| Other countries | | 6,271 |
| Total | | \$79,037 |

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

| Tires: | Value. | Value. |
|-----------------------------------|-----------|--------|
| To— | | |
| Great Britain | \$16,803 | ..... |
| United States | 16,909 | ..... |
| Newfoundland | 158 | ..... |
| Other countries | 26,707 | ..... |
| Total | \$60,577 | ..... |
| *Rubber waste: | | |
| To— | | |
| Great Britain | \$4,628 | ..... |
| United States | 16,482 | ..... |
| Total | \$21,110 | ..... |
| All other manufactures, N. O. P.: | | |
| To— | | |
| Great Britain | \$12,371 | ..... |
| United States | 176 | \$557 |
| Newfoundland | 912 | ..... |
| New Zealand | 89 | ..... |
| Other countries | 1,703 | ..... |
| Totals | \$15,453 | \$557 |
| †Gum chicle: | | |
| To— | | |
| Great Britain ..... | ..... | \$188 |
| United States | \$236,065 | 493 |
| Totals | \$236,065 | \$681 |

*During September 165,800 pounds of rubber waste was exported to the United States and 38,600 pounds to Great Britain.

†During September 447,315 pounds of gum chicle was exported to United States and 539 pounds to Great Britain.

UNITED KINGDOM RUBBER STATISTICS.

| IMPORTS. | | |
|--|------------|-------------|
| October, 1916. | | |
| UNMANUFACTURED— | Pounds. | Value. |
| Crude rubber: | | |
| From— | | |
| Dutch East Indies | 849,600 | \$501,523 |
| French West Africa | 37,600 | 10,796 |
| Gold Coast | 122,600 | 49,771 |
| Other countries in Africa | 895,800 | 453,333 |
| Peru | 700 | 357 |
| Brazil | 1,799,800 | 1,199,896 |
| British India | 445,500 | 261,186 |
| Straits Settlements and dependencies, including Labuan | 2,713,500 | 1,622,193 |
| Federated Malay States | 3,107,100 | 1,975,490 |
| Ceylon and dependencies | 1,599,000 | 330,947 |
| Other countries | 258,400 | 152,891 |
| Totals | 11,829,600 | \$6,558,383 |
| Waste and reclaimed rubber | 454,300 | \$28,403 |
| Gutta percha | 502,400 | 277,712 |
| MANUFACTURED— | | |
| Apparel, waterproofed ..... | ..... | \$1,447 |
| Boots and shoes, dozen pairs | 27,470 | 288,341 |
| Insulated wire | 72,228 | 5,588 |
| Automobile tires and tubes ..... | ..... | 405,633 |
| Motorcycle tires and tubes ..... | ..... | 2,225 |
| Cycle tires and tubes ..... | ..... | 81,082 |
| Tires not specified ..... | ..... | 257 |
| Totals ..... | ..... | \$1,447 |
| EXPORTS. | | |
| October, 1916. | | |
| MANUFACTURED— | Pounds. | Value. |
| Apparel, waterproofed: | | |
| To— | | |
| France ..... | ..... | \$80,696 |
| British South Africa ..... | ..... | 27,437 |
| British East Indies ..... | ..... | 5,588 |
| Australia ..... | ..... | 31,211 |
| New Zealand ..... | ..... | 20,111 |
| Canada ..... | ..... | 29,517 |
| Other countries ..... | ..... | 245,626 |
| Totals ..... | ..... | \$440,186 |
| Boots and shoes, dozen pairs | 14,703 | \$105,805 |
| Insulated wire ..... | ..... | 263,804 |
| Submarine cables ..... | ..... | 102,283 |
| Automobile tires and tubes ..... | ..... | 411,210 |
| Motorcycle tires and tubes ..... | ..... | 57,401 |
| Cycle tires and tubes ..... | ..... | 164,501 |
| Tires not specified ..... | ..... | 114,883 |
| Manufactures not specified ..... | ..... | 657,842 |

EXPORTS—FOREIGN AND COLONIAL.

| October, 1916. | | |
|------------------------------------|-----------|-------------|
| UNMANUFACTURED— | Pounds. | Value. |
| Crude rubber: | | |
| To— | | |
| Russia | 33,600 | \$23,657 |
| France | 1,878,100 | 1,001,142 |
| United States | 3,460,200 | 1,817,844 |
| Other countries | 1,375,500 | 860,637 |
| Totals | 6,747,400 | \$3,703,280 |
| Waste and reclaimed rubber | 34,600 | \$6,142 |
| Gutta percha | 58,500 | 24,562 |
| MANUFACTURED— | | |
| Apparel, waterproofed ..... | ..... | \$62 |
| Boots and shoes, dozen pairs | 2,973 | 15,227 |
| Insulated wire ..... | ..... | 3,242 |
| Automobile tires and tubes ..... | ..... | 434,935 |
| Motorcycle tires and tubes ..... | ..... | 5,422 |
| Cycle tires and tubes ..... | ..... | 343 |
| Tires not specified ..... | ..... | 5,512 |

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

| Eight Months Ending August, 1916. | | |
|---|-----------|-------------|
| UNMANUFACTURED— | Pounds. | Value. |
| India rubber and gutta percha —raw and reclaimed: | | |
| From— | | |
| Great Britain | 2,265,560 | ..... |
| Straits Settlements | 1,135,420 | ..... |
| African French Colony | 6,380 | ..... |
| Belgian Congo | 219,120 | ..... |
| Brazil | 3,419,460 | ..... |
| Other countries | 940,280 | ..... |
| Totals | 7,986,220 | \$5,604,874 |
| Rubber scrap | 4,928,220 | \$389,105 |
| MANUFACTURED— | | |
| India rubber and gutta percha —threads: | | |
| From— | | |
| United States | 45,100 | ..... |
| Great Britain | 24,420 | ..... |
| Other countries | 6,380 | ..... |
| Totals | 75,900 | \$133,170 |
| India rubber and gutta percha —sheets: | | |
| Cut sheets | 2,420 | \$3,609 |
| Elastic fabric | 220 | 87 |
| Insulated wire | 440 | 116 |
| Hard rubber | 27,720 | 19,454 |
| India rubber and gutta percha —tubes: | | |
| Cut sheets | 1,100 | \$1,737 |
| Elastic fabric | 9,020 | 4,748 |
| Other forms | 4,180 | 2,666 |
| Belting | 95,480 | 58,723 |
| Rubber coated fabrics, pieces | 93,280 | 114,565 |
| Boots and shoes:—pairs | | |
| From— | | |
| United States | 15,078 | ..... |
| France | 10,283 | ..... |
| Other countries | 143 | ..... |
| Totals | 25,504 | \$24,611 |
| Elastic webbing: | | |
| From— | | |
| France | 14,520 | ..... |
| Germany | 880 | ..... |
| Other countries | 19,800 | ..... |
| Totals | 35,200 | \$46,320 |
| Elastic fabric—not specified: | | |
| From— | | |
| France | 215,600 | ..... |
| Great Britain | 91,740 | ..... |
| Other countries | 7,480 | ..... |
| Totals | 314,820 | \$248,565 |

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

| Tires: | Pounds. | Value. |
|----------------------------|-----------|--------------|
| From— | | |
| France | 816,860 | ..... |
| Great Britain | 340,340 | ..... |
| Other countries | 24,860 | ..... |
| Totals | 1,182,060 | \$2,073,978 |
| Other rubber manufactures: | | |
| From— | | |
| United States | 1,169,520 | ..... |
| France | 872,300 | ..... |
| Great Britain | 589,160 | ..... |
| Other countries | 880 | ..... |
| Totals | 2,631,860 | \$1,847,087 |
| Total Imports ..... | ..... | \$10,573,415 |

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

| Eight Months Ending August, 1916. | | |
|---|-----------|--------------|
| UNMANUFACTURED— | Pounds. | Value. |
| India rubber and gutta percha —raw and reclaimed: | | |
| From— | | |
| France | 735,460 | \$254,220 |
| MANUFACTURED— | | |
| India rubber and gutta percha —threads: | | |
| To— | | |
| France | 6,600 | ..... |
| Great Britain | 8,580 | ..... |
| Argentina | 3,740 | ..... |
| Other countries | 19,580 | ..... |
| Totals | 38,500 | \$67,550 |
| India rubber and gutta percha —sheets: | | |
| Cut sheets | 3,520 | \$5,250 |
| Elastic fabric | 1,980 | 782 |
| Insulated wire | 660 | 174 |
| Hard rubber | 43,780 | 30,726 |
| India rubber and gutta percha —tubes: | | |
| Cut sheets | 9,460 | \$14,938 |
| Elastic fabric | 75,020 | 39,488 |
| Other forms | 96,360 | 44,174 |
| Belting | 1,540 | 946 |
| Elastic webbing: | | |
| To— | | |
| France | 6,160 | ..... |
| Greece | 75,900 | ..... |
| Egypt | 18,700 | ..... |
| Argentina | 85,580 | ..... |
| Brazil | 77,880 | ..... |
| Cuba | 24,860 | ..... |
| Other countries | 139,260 | ..... |
| Totals | 428,340 | \$563,657 |
| Elastic fabric—not specified: | | |
| To— | | |
| Spain | 440 | ..... |
| Argentina | 22,000 | ..... |
| Brazil | 220 | ..... |
| Uruguay | 1,760 | ..... |
| Other countries | 10,780 | ..... |
| Totals | 35,200 | \$61,760 |
| Tires: | | |
| To— | | |
| France | 156,420 | ..... |
| Great Britain | 3,070,540 | ..... |
| Switzerland | 66,660 | ..... |
| India and Ceylon | 353,540 | ..... |
| Australia | 78,540 | ..... |
| Argentina | 787,820 | ..... |
| Brazil | 453,200 | ..... |
| Other countries | 378,180 | ..... |
| Totals | 5,344,900 | \$9,377,870 |
| Other rubber manufactures: | | |
| To— | | |
| Great Britain | 42,460 | ..... |
| Switzerland | 44,000 | ..... |
| Argentina | 70,620 | ..... |
| Other countries | 166,540 | ..... |
| Totals | 323,620 | \$227,122 |
| Total Exports ..... | ..... | \$10,688,657 |

LONDON AND LIVERPOOL RUBBER STATISTICS.

IMPORTS.

October, 1916.

| UNMANUFACTURED— Crude Rubber: | London. | | Liverpool. | |
|---|-----------|-------------|------------|-------------|
| | Pounds. | Value. | Pounds. | Value. |
| From German West Africa | | | 2,700 | \$1,385 |
| Java | 562,400 | \$325,722 | | |
| Other Dutch Posses- sions in Indian Seas | 287,200 | 175,801 | | |
| France | | | 70,000 | 31,573 |
| French West Africa | | | 37,600 | 10,796 |
| Madagascar | 9,000 | 3,227 | | |
| Portugal | 2,800 | 1,985 | 2,200 | 571 |
| Portugese E. Africa. | 22,900 | 12,447 | | |
| Spain | | | 300 | 181 |
| Liberia | | | 13,900 | 3,023 |
| United States | | | 1,000 | 424 |
| Peru | | | 700 | 357 |
| Brazil | 4,700 | 3,356 | 1,795,100 | 1,196,540 |
| Uruguay | | | 42,600 | 24,252 |
| Bolivia | | | 29,100 | 17,326 |
| Egypt | 6,700 | 3,494 | | |
| Sierra Leone | | | 100 | 33 |
| Gold Coast | | | 122,600 | 49,771 |
| Nigeria | | | 67,600 | 23,762 |
| Cape of Good Hope. | 83,600 | 60,285 | | |
| British East Africa. | 300 | 152 | | |
| Nyasaland | 10,500 | 6,902 | | |
| British India | 445,500 | 261,186 | | |
| Straits Settlements and Dependencies. | 2,372,200 | 1,411,554 | 341,300 | 210,649 |
| Fed. Malay States. | 3,107,100 | 1,975,390 | | |
| Ceylon and Depend- encies | 1,563,500 | 874,621 | 35,500 | 20,439 |
| British N. Borneo. | 108,700 | 75,322 | | |
| New South Wales. | 1,300 | 785 | | |
| British West Indies. | 1,000 | 714 | | |
| British Guiana. | 1,800 | 1,000 | | |
| Seychelles | 500 | 262 | | |
| Totals | 8,591,700 | \$5,204,205 | 2,562,300 | \$1,591,082 |

| | | | | |
|-----------------------------|---------|----------|--------|---------|
| Waste and Reclaimed Rubber: | | | | |
| From United States..... | 64,500 | \$14,756 | 30,000 | \$4,817 |
| Portugal | 18,800 | 1,999 | | |
| Channel Island | 5,800 | 381 | | |
| Egypt | 11,400 | 1,052 | | |
| Cape of Good Hope. | 15,000 | 1,390 | | |
| British India | 13,400 | 1,271 | | |
| New Zealand | 38,000 | 1,604 | | |
| British West Indies. | 900 | 48 | | |
| Totals | 167,800 | \$22,501 | 30,000 | \$4,817 |

EXPORTS.

| | | | | |
|--|---------|----------|----------|----------|
| Waste and reclaimed rubber manufactures of the United Kingdom: | | | | |
| To France | 62,900 | \$5,307 | \$56,800 | \$11,695 |
| Spain | 35,400 | 2,718 | 13,000 | 2,841 |
| Italy | 79,600 | 3,727 | | |
| United States | 728,900 | 36,285 | 371,100 | 40,622 |
| Straits Settlements..... | 1,100 | 224 | | |
| New South Wales..... | 6,000 | 1,081 | | |
| Canada | 57,700 | 2,475 | | |
| Russia | | | 13,500 | 4,141 |
| Japan | | | 11,300 | 1,457 |
| Totals | 971,600 | \$51,817 | 465,700 | \$60,756 |

RE-EXPORTS.

| | | | | |
|----------------------|-----------|-------------|-----------|-----------|
| Crude rubber: | | | | |
| To Sweden | 51,300 | \$27,565 | 26,900 | \$16,541 |
| Denmark | 29,200 | 16,570 | | |
| France | 1,488,900 | 804,192 | 255,800 | 162,064 |
| Spain | 33,700 | 20,254 | 30,600 | 18,826 |
| Italy | 143,300 | 86,532 | 161,200 | 100,864 |
| United States | 2,968,400 | 1,602,469 | 426,200 | 175,720 |
| New South Wales..... | 4,500 | 1,147 | 24,800 | 16,332 |
| Canada | 720,200 | 454,028 | 19,100 | 8,854 |
| Russia | | | 33,600 | 23,657 |
| Norway | | | 8,900 | 5,141 |
| Japan | | | 5,600 | 4,108 |
| Victoria | | | 114,000 | 82,686 |
| Totals | 5,439,500 | \$3,012,757 | 1,106,700 | \$614,793 |

| | | | | |
|-----------------------------|--|--|--------|---------|
| Waste and reclaimed rubber: | | | | |
| To France | | | 21,200 | \$4,204 |
| Italy | | | 13,400 | 5,299 |
| Totals | | | 34,600 | \$7,503 |

THE MARKET FOR RUBBER SCRAP.

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NEW YORK.

WHATEVER strength developed in the rubber scrap market early in the month was due, no doubt, to the firm position of crude rubber, which had advanced strongly. This has to a certain extent supported the scrap market, which has been generally firm throughout the month with prices ruling about the same as those quoted a month ago. About the middle of the month rumors of peace resulted in cautious trading that featured the market until the inevitable quiet of the holiday season prevailed. The many railroad embargoes have, moreover, adversely affected trading at this time and caused more or less difficulties in shipping and receiving stocks. There was an easier tendency noticed during the last week of the month and lower values seemed imminent, but the volume of business done was insufficient to affect the level of prices.

BOOTS AND SHOES. There has been some business done at 10 cents delivered, but 10½ cents was the accepted dealers' price for 50-ton lots. It is evident that supplies are not accumulating to such an extent as to be burdensome. Trimmed and untrimmed arctics have moved freely, the former bringing as high as 7½ cents and the latter 6½ to 6¼ cents in a firm market.

AUTO TIRES. Tires have been offered rather freely. Mixed tires were fairly firm, but not very interesting to the mills at 7 cents, although this price may have been shaded in some instances. The special grades of white G. & G. tires were dull and featureless at 8½ cents. Bicycle and solid tires were in good demand at firm prices, ranging from 4¾ to 5 cents for the former and 5½ to 5¾ cents for the latter.

INNER TUBES. The demand has been good at prices slightly in advance of those quoted a month ago. Sales of No. 1 tubes have been made to the mills at 26 to 26½ cents delivered. No. 2 and red tubes have been firm at 11½ cents.

MECHANICALS. Business in all grades has been very quiet and confined to small lots. Hose, however, has received some attention and has been fairly firm in price, the large grade bringing 1¾ cents. Air-brake hose had a limited call at 5¾ cents delivered.

London imports of waste and reclaimed rubber for November were 109,300 pounds; Liverpool, 20,100 pounds. Exports from London were 1,244,000 pounds; from Liverpool, 106,800 pounds.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

DECEMBER 26, 1916.

Prices subject to change without notice.

| | Per Pound. |
|--|---------------|
| Boots and shoes..... | \$0.09½ @ .10 |
| Trimmed arctics..... | .07½ @ .07¾ |
| Untrimmed arctics..... | .06½ @ .06¾ |
| White tires, Goodrich and Goodyear..... | .08½ @ .08¾ |
| Auto tires, standard white..... | .06¾ @ .06¾ |
| standard mixed..... | .06¾ @ .06¾ |
| stripped, unguaranteed..... | .04¾ @ .05 |
| Auto peelings, No. 1..... | .09½ @ |
| No. 2..... | .08¼ @ |
| Inner tubes, No. 1..... | .25½ @ .26 |
| No. 2..... | .11½ @ |
| red..... | .11½ @ |
| Irony tires..... | .02½ @ |
| Bicycle tires..... | .04¾ @ .04¾ |
| Solid tires..... | .05¾ @ .06 |
| White scrap, No. 1..... | .13½ @ .14 |
| No. 2..... | .10 @ |
| Red scrap, No. 1..... | .10 @ .11 |
| No. 2..... | .08 @ |
| Mixed black scrap, No. 1..... | .04¾ @ |
| No. 2..... | .04 @ |
| Rubber car springs..... | .04½ @ |
| Horse shoe pads..... | .04¾ @ |
| Matting and packings..... | .01 @ |
| Garden hose..... | .01¾ @ .01¾ |
| Air brake hose..... | .05½ @ .05¾ |
| Cotton fire hose..... | .02½ @ |
| Large hose..... | .01¾ @ |
| Hard rubber scrap, No. 1, bright fracture..... | .26 @ |
| Battery jars (black compound)..... | .02½ @ |
| Insulated wire stripping..... | .03½ @ |
| Rubber heels..... | .03¾ @ |

THE MARKET FOR COTTON AND OTHER FABRICS.

Copyright, 1917.

NEW YORK.

THE American cotton market has experienced violent fluctuations and extraordinary price changes in the month just past. Liquidation has been very heavy. From 20 cents, the New York spot price on December 1, cotton declined to 16½ cents by the 23d of the month. March contracts sold at 16.22 on December 21, representing a decline of \$25.50 per bale from the high prices recorded late in November. Possibility of the crop forecast being underestimated, general optimism in regards to peace prospects and confidence in future consumption had a restraining influence on the market, which later in the month became stronger. Unsettled conditions still prevail and caution appears to be dominating the present situation.

EGYPTIAN COTTON. Sudden and violent fluctuations have characterized the Alexandria market during December. Sakellarides sold for 47 cents, with the other grades in the list comparatively high. That stocks are being held in anticipation of further advances is generally conceded. Crop estimates are said to be too optimistic in view of the short acreage and dangers that threaten the growing plant.

SEA ISLAND COTTON. The active demand in evidence at Savannah early in the month absorbed all the round lots offered at 52 cents. The market continued quiet until the middle of the month when considerable inquiry developed and prices that had dropped to 50 cents became firmer. Some small business was done prior to the holidays at prices around 50 cents, and the condition of the market was generally quiet. Holders are not disposed to sell their good grades, but appear willing to make concessions on the inferior sorts. Stocks at Savannah and Charleston, December 1, were 8,653 bales, against 14,875 bales a year ago.

MECHANICAL DUCK. The demand for hose and belting duck continues to be good, and contracts are being made covering the last half of next year. Prices softened somewhat with the decline in the raw material, resulting in a loss of ½ cent a pound in belting duck. The outlook is for higher rather than lower prices, due to the uncertainty of sufficient supplies of raw cotton and the large demand for mechanical duck that comes with the usual industrial activity in the spring.

SHEETINGS, OSNABURGS AND DRILLS. There has been a fair demand for these fabrics and with few exceptions prices have remained about the same as a month ago. A brisk demand from Canada was noted during the month, while European business was very quiet. The decline in raw cotton affected only spot goods for immediate delivery and at prices a little under the market.

TIRE FABRICS. The demand has continued to be good for all grades of fabrics used in tire building. The mills are still sold far ahead and contracts have been made covering the requirements of the trade for next year. In fact, prices have advanced about 5 cents the square yard within a month, and there are no basic reasons for a belief in lower prices under the present market conditions.

NEW YORK QUOTATIONS.

DECEMBER 26, 1916.

Prices subject to change without notice.

| Aeroplane and Balloon Fabrics: | | | |
|---|------|-----------|-----|
| Wamsutta, S. A. I. L. No. 1, 40-inch..... | yard | \$0.32¼ @ | |
| O/X B. No. 4, 38¼-inch..... | | 32¼ @ | |
| 36-inch..... | | Nominal | |
| Wool Stockinettes—52-inch: | | | |
| A—14-ounce..... | yard | 1.25 @ | |
| B—14-ounce..... | | 1.50 @ | |
| C—14-ounce..... | | 1.75 @ | |
| Cotton Stockinettes—52-inch: | | | |
| D—14-ounce..... | yard | .50 @ | .55 |
| E—11½-ounce..... | | .42 @ | .50 |
| F—14-ounce..... | | .55 @ | .60 |
| G—8-ounce..... | | .48 @ | .50 |
| H—11-ounce..... | | .50 @ | .55 |
| I—9-ounce..... | | .42 @ | .45 |

| Colors—white, black, blue, brown. | | | |
|---|-------------|---------|------|
| Kritabac Stockinette..... | lb. | .90 @ | .95 |
| Tire Fabrics: | | | |
| 17¼-ounce Sea Island, combed..... | square yard | 1.25 @ | 1.35 |
| 17¼-ounce Egyptian, combed..... | | 1.10 @ | 1.15 |
| 17¼-ounce Egyptian, carded..... | | 1.07 @ | 1.12 |
| 17¼-ounce Peckers, carded..... | | .70 @ | |
| Sheeting: | | | |
| 40-inch 2.35-yard..... | yard | .15¼ @ | |
| 40-inch 2.50-yard..... | | .14¼ @ | |
| 40-inch 2.70-yard..... | | .14 @ | |
| 40-inch 2.85-yard..... | | .13 @ | |
| 40-inch 3.15-yard..... | | .12¼ @ | |
| Osnaburgs: | | | |
| 40-inch 2.25-yard..... | yard | .16¼ @ | |
| 40-inch 2.48-yard..... | | .15 @ | |
| 37½-in. 2.42-yard..... | | .15¼ @ | |
| Mechanical Ducks: | | | |
| Hose..... | pound | .38 @ | .39 |
| Belting..... | | .37 @ | .38 |
| Carriage Cloth Ducks: | | | |
| 38-inch 2.00-yard enameling duck..... | yard | .20 @ | |
| 38-inch 1.74-yard..... | | .22¼ @ | |
| 72-inch 16.66-ounce..... | | .43¼ @ | |
| 72-inch 17.21-ounce..... | | .45 @ | |
| Drills: | | | |
| 38-inch 2.00-yard..... | yard | .19 @ | |
| 40-inch 2.47-yard..... | | .15¼ @ | |
| 52-inch 1.90-yard..... | | .20¼ @ | |
| 52-inch 1.95-yard..... | | .20 @ | |
| 60-inch 1.52-yard..... | | .26¼ @ | |
| Yarns: | | | |
| Garden Hose, 12/2 cabled..... | pound | Nominal | |
| Fire Hose 12/1..... | | Nominal | |
| Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies: | | | |
| 63-inch, 3¼ to 7½ ounces..... | square yard | .38 @ | 1.55 |
| 36-inch, 2¼ to 5 ounces..... | | .35 @ | .85 |
| Imported Plaid Lining (Union and Cotton): | | | |
| 63-inch, 2 to 4 ounces..... | square yard | .35 @ | .75 |
| 36-inch, 2 to 4 ounces..... | | .25 @ | .30 |
| Domestic Worsted Fabrics: | | | |
| 36-inch, 4¼ to 8 ounces..... | square yard | .32¼ @ | .57¼ |
| Domestic Woven Plain Linings (Cotton): | | | |
| 36-inch, 3¼ to 5 ounces..... | square yard | .15¼ @ | .20 |
| Raincoat Cloth (Cotton): | | | |
| Bombazine..... | yard | .08 @ | .08¼ |
| Twills..... | | .12 @ | .18 |
| Twined..... | | .25 @ | .35 |
| Twined, printed..... | | .07¼ @ | .15 |
| Plaid..... | | .08¼ @ | .10 |
| Ropp..... | | .24 @ | .27 |
| Burlaps: | | | |
| 32—7½-ounce..... | 100 yards | 7.20 @ | |
| 40—7½-ounce..... | | 8.50 @ | |
| 40—8-ounce..... | | 8.75 @ | |
| 40—10-ounce..... | | 10.00 @ | |
| 40—10½-ounce..... | | 10.25 @ | |
| 45—7½-ounce..... | | 9.60 @ | |
| 45—8-ounce..... | | 9.75 @ | |
| 48—10-ounce..... | | 12.50 @ | |

THE MARKET FOR CHEMICALS AND COMPOUND-INGREDIENTS.

Copyright, 1917.

NEW YORK.

THE trade in rubber chemicals and ingredients has been exceedingly active during the month of December. The former conditions that created high ocean rates and insurance and limited cargo space have continued and supplies of raw materials are still difficult to obtain. Domestic producers of both crude and manufactured compounding ingredients are running full capacity to meet the demand. There is no doubt that a great many chemicals formerly imported will be permanently manufactured in this country.

Colors have been rather weak with the exception of Indian red and red oxide, largely due to the small production and the unwillingness of manufacturers to increase their output under prevailing conditions.

ACCELERATORS. Tri-nitro-benzene is not commercially made in this country. Accelerene, a new organic accelerator, is now on the market.

ANILINE OIL. Aniline oil is now sold in a dry powder form and from which the disagreeable fumes have been removed. It is claimed to produce a very tough compound that ages well. Prices have been firm on the standard grades.

ANTIMONY SULPHURET. Considerable interest was shown in the best grades of domestic crimson and golden sulphuret of antimony. American producers appear to be firmly established in the manufacture of this material. Business has been good and

prices unchanged. Contracts have been written covering next year's requirement.

ALUMINUM FLAKE. There has been considerable business done in flake and prices have advanced during the month.

CARBONATE OF MAGNESIA. The export demand has been active, resulting in greatly advanced prices for the standard grades. Domestic producers are well sold ahead.

BARYTES. The demand has been fairly steady with rather quiet conditions prevailing later in the month. Higher prices are expected.

GAS CARBON BLACK. All grades were in demand and prices have advanced in a generally firm market.

LITHARGE. There has been a fair demand for this material which has occupied a firm position during the month due to the strong position of pig lead. Higher prices are predicted.

LITHOPONE. Domestic grades have been in good demand at firm prices that have not changed during the month. Imported grades have been offered at prices subject to previous sale.

OXIDE OF IRON. The bright grades are very scarce and high due to the position of the copper metal.

SHELLAC. This is very high and there is little prospect of relief while uncertain ocean shipments continue.

WHITING. The difficulties attending shipment of the raw material continue. Domestic production of chalk whiting has advanced materially and there are prospects of the situation being considerably relieved thereby.

ZINC OXIDE. Contract prices on French process oxide of zinc have advanced 1½ cents a pound on green, red and white seal since our report of a month ago.

NEW YORK QUOTATIONS.

DECEMBER 27, 1916.

Subject to change without notice.

| | | |
|--|------|---------------|
| Accelerene | lb. | Nominal |
| Acetone (drums) | lb. | \$0.22 @ 0.24 |
| Acid, acetic, 28 per cent. (bbls.) | lb. | .04½ @ .05 |
| cresylic (crude) | gal. | 1.00 @ .40 |
| glacial, 99 per cent. (carboys) | lb. | .30 @ .40 |
| muriatic, 20 degrees | lb. | .02 @ .05 |
| nitric, 36 degrees | lb. | .05 @ .02 |
| sulphuric, 66 degrees | lb. | .01¼ @ .02 |
| Alumina Pigment, No. 1 Tosiko | ton | 19.00 @ |
| Aluminum Flake (carloads) | ton | 22.00 @ |
| Ammonium carbonate | lb. | .13½ @ |
| Antimony, crimson, sulphuret of (casks) | lb. | .50 @ .60 |
| crimson, "Magmetco" | lb. | Nominal |
| crimson, "Mephisto" (casks) | lb. | .50 @ |
| golden, sulphuret of (casks) | lb. | .25 @ .35 |
| golden, "Magmetco" | lb. | Nominal |
| golden, "Mephisto" | lb. | .29 @ |
| golden, sulphuret, States brand, 16-17 per cent. | lb. | .35 @ |
| Asbestine | ton | 20.00 @ |
| Asbestos | ton | 20.00 @ 40.00 |
| Asphaltum "C" Brilliant | lb. | .03½ @ |
| Barium sulphate, precipitated | lb. | .05½ @ |
| Barytes, pure white | ton | 31.00 @ |
| off color | ton | 22.50 @ |
| Basofo | ton | 112.00 @ |
| Benzol, pure | gal. | 1.00 @ |
| Beta-Naphthol | lb. | 1.00 @ |
| Brown, sienna, raw powdered | lb. | .04 @ .06 |
| umber, raw powdered | lb. | .03 @ .03½ |
| Bone ash | lb. | Nominal |
| black | lb. | .04 @ .08 |
| Cadmium tri-sulphate (f. o. b. London) | lb. | Nominal |
| sulphide, yellow | lb. | 2.25 @ |
| Cantella gum | lb. | .33 @ .38 |
| Carbon, bisulphide (drums) | lb. | .05 @ |
| black (cases) | lb. | .20 @ |
| tetrachloride (drums) | lb. | .18 @ |
| Caustic soda, 76 per cent. | lb. | .05 @ |
| Chalk, precipitated, extra light | lb. | .04½ @ .05½ |
| precipitated, heavy | lb. | .03½ @ .05 |
| China clay, domestic | ton | 20.00 @ |
| imported | ton | 40.00 @ 50.00 |
| Chrome, green | lb. | .15 @ .50 |
| yellow | lb. | .25 @ |
| Cotton linters | lb. | .07½ @ |
| Fossil flour | lb. | .03½ @ |
| Gas black | lb. | .18 @ .25 |
| Gilsonite | ton | 40.00 @ |
| Glue, high grade | lb. | .25 @ .33 |
| medium | lb. | .22 @ .23 |
| low grade | lb. | .20 @ .21 |
| Glycerine, C. P. (drums) | lb. | .36 @ |
| Graphite, flake (400 pound bbl.) | lb. | .14 @ |
| powdered (400 pound bbl.) | lb. | .07 @ |
| Green oxide of chromium (casks) | lb. | .75 @ |
| Ground glass (fine) | lb. | .02¼ @ |
| Hexamethylene Tetramine | lb. | .65 @ |
| Indian red, reduced grades | lb. | .04¼ @ .07½ |
| pure | lb. | .08½ @ .09½ |
| Infusorial earth, powdered | ton | 60.00 @ |
| bolted | ton | 65.00 @ |

| | | |
|--|----------------------|---------------|
| Iron oxide, red, reduced grades | lb. | .02¼ @ .03½ |
| red, pure, bright | lb. | .08½ @ .09 |
| Ivory, black | lb. | .16 @ .30 |
| Lampblack | lb. | .12 @ |
| Lead, red oxide of | lb. | .09¼ @ |
| sublimed blue | lb. | .08¼ @ |
| sublimed white | lb. | .08¼ @ |
| white, basic carbonate | lb. | .08¼ @ |
| white, basic sulphate | lb. | Nominal |
| black hyposulphite (Black Hypo) | lb. | .45 @ .75 |
| Lime, flour | lb. | .01½ @ |
| Litharge | lb. | .09½ @ |
| English | lb. | .10 @ .11 |
| sublimed | lb. | .09½ @ |
| Lithopone, imported | lb. | Nominal |
| domestic | lb. | .07 @ |
| Beckton white (carloads) | lb. | Nominal |
| Magnesia, carbonate | lb. | .09½ @ |
| calcined, heavy, Thistle Brand | lb. | .12 @ |
| light | lb. | .50 @ |
| Magnesite, calcined, powdered | ton | 35.00 @ 39.00 |
| Mica, powdered | lb. | .03¼ @ .05½ |
| Mineral rubber | lb. | .01 @ .02 |
| "M. R. X." | ton | 100.00 @ |
| "Genasco" (carloads) | ton | 37.00 @ |
| "J. M. R." | ton | 57.50 @ |
| "Richmond Brand" | ton | .03 @ |
| "No. 64 Brand" | ton | 35.00 @ |
| "Refined Elaterite" | ton | .05 @ |
| "Rubrax" | ton | 32.50 @ |
| Naphtha, stove gasoline (steel bbls.) | gal. | .22 @ |
| 66@68 degrees (steel bbls.) | gal. | .27 @ |
| 68@70 degrees (steel bbls.) | gal. | .28 @ |
| V. M. & P. (steel bbls.) | gal. | .21 @ |
| Oil, aniline | lb. | .23 @ .24 |
| corn, refined | cwt. | 13.01 @ |
| linseed (bbl.) | gal. | .93 @ |
| palm | lb. | .12 @ .12½ |
| paraffin | gal. | .17 @ |
| pine (cases) | gal. | .64 @ |
| rapeseed | gal. | 1.00 @ 1.05 |
| rosin, heavy body | gal. | 6.75 @ |
| tar (cases) | gal. | .21½ @ |
| soluble aniline colors, yellow, orange, red, violet, blue, green | lb. | 5.00 @ 15.00 |
| Orange mineral, domestic | lb. | .12 @ |
| Paragol (carloads) | cwt. | 10.54 @ |
| Petrolatum | lb. | .06½ @ |
| Petroleum grease | lb. | .04½ @ |
| Pine solvent | lb. | Nominal |
| Pine tar | bbi. | 8.50 @ |
| Pitch, burgundy | lb. | .04 @ .05 |
| coal tar | bbi. | 4.50 @ |
| pine tar | lb. | .02¼ @ |
| Plaster of paris | lb. | 1.50 @ 1.70 |
| Prussian blue | lb. | 1.00 @ |
| Pumice stone, powdered (bbls.) | lb. | .03 @ .04 |
| Resin, Pontianak, refined | lb. | .25 @ |
| granulated | lb. | .20 @ |
| fused | lb. | Nominal |
| Rosin (280 pound bbls.) | bbi. | 6.85 @ 7.80 |
| Rotten stone, powdered | lb. | .02¼ @ .04 |
| Rubber black | lb. | .06 @ |
| Rubber substitute, black | lb. | .08½ @ .12 |
| white | lb. | .12½ @ .17 |
| brown | lb. | .12½ @ .17 |
| Rubhide | lb. | Nominal |
| Shellac, fine orange | lb. | .48 @ |
| Silex (silica) | ton | 20.00 @ 26.00 |
| Soapstone, powdered | ton | 8.50 @ 13.75 |
| Starch, corn, powdered | lb. | .04 @ .04½ |
| Sulphur chloride (drums) | lb. | .09½ @ |
| Sulphur, flour, velvet, brand (carloads) | cwt. | 2.20 @ |
| Bergenport, pure soft brand | cwt. | 2.20 @ |
| Talc, American | ton | 8.50 @ 13.75 |
| French | ton | 24.50 @ |
| Tolpol, pure | gal. | 2.50 @ |
| Tripolite earth, powdered | ton | 60.00 @ |
| bolted | ton | 65.00 @ |
| Turpentine, pure gum spirits | ton | 55 @ |
| wood | gal. | .50 @ |
| Venice | gal. | .11 @ .12 |
| Ultramarine blue | lb. | .15 @ .50 |
| Vermilion, brilliant | lb. | .85 @ |
| Chinese | lb. | .95 @ 1.00 |
| English | lb. | 1.50 @ 1.60 |
| Wax, beeswax, white | lb. | .49 @ .60 |
| ceresin, white | lb. | .12 @ .20 |
| carnauba | lb. | .28 @ .48 |
| ozokerite, black | lb. | .60 @ .65 |
| green | lb. | .78 @ .83 |
| montan | lb. | .28½ @ .30 |
| paraffin, refined 118/120 m. p. (cases) | lb. | .05½ @ .06 |
| 123/125 m. p. (cases) | lb. | .06 @ .06½ |
| 128/130 m. p. (cases) | lb. | .08½ @ .09 |
| 133/136 m. p. (cases) | lb. | .09½ @ .12 |
| crude, white, 117/119 m. p. (bbls.) | lb. | Nominal |
| yellow, 124/126 m. p. (bbls.) | lb. | .06½ @ |
| Whiting, Alha | cwt. | .75 @ .95 |
| commercial | cwt. | .75 @ .85 |
| gilders | cwt. | .90 @ 1.00 |
| Paris, white, American | cwt. | 1.10 @ |
| English cliffstone | cwt. | 1.25 @ 1.50 |
| Wood pulp XXX (carloads) | ton | Nominal |
| Yellow ochre (Satin) | lb. | .02¼ @ |
| india rubber | lb. | 1.50 @ |
| Zinc oxide, American process, horsehead brand | lb. | .10½ @ |
| "special" | f. o. b. factory lb. | .10 @ |
| "XX red" | f. o. b. factory lb. | .10 @ |
| French process, green seal | f. o. b. factory lb. | .18½ @ |
| red seal | f. o. b. factory lb. | .17½ @ |
| white seal | f. o. b. factory lb. | .18½ @ |
| Zinc substitutes | ton | 25.00 @ |
| Zinc sulphide, pure | lb. | .15 @ |



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